



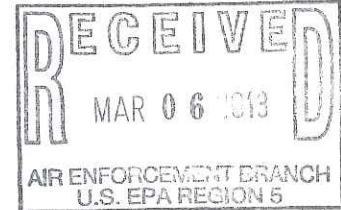
CITGO Petroleum Corporation

P.O. Box 4689
Houston, TX 77210-4689

CERTIFIED MAIL RETURN RECEIPT REQUESTED
7011 1570 0003 0286 6072

February 26, 2013

Chief
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611, Ben Franklin Station
Washington, DC 20044-7611
Reference Case No. 90-5-2-1-07277



Re: Semi-Annual Report
Report Covering Period July 1, 2012 – December 31, 2012
CITGO Petroleum Corporation
Civil Action Number H-04-3883
Southern District of Texas, Consent Decree entered January 26, 2005

Dear Chief:

Pursuant to Section IX of the referenced Consent Decree, CITGO is submitting the Semi-Annual Report for the 2nd half of 2012 for the Covered Refineries. The Covered Refineries include the Corpus Christi East Refinery, the Corpus Christi West Refinery, the Lake Charles Refinery, and the Lemont Refinery. The Paulsboro and Savannah Refineries are owned and operated by NuStar Asphalt Refining, LLC. Semi-annual reports for these facilities are submitted by CITGO Petroleum Corporation. This report covers the period from July 1, 2012 through December 31, 2012.

The Semi-Annual Report consists of individual reports for each of the Covered Refineries, and therefore six reports are enclosed. Each individual report consists of a spreadsheet listing each applicable Consent Decree topic, Paragraph reference, due date, submittal or completion date, a description of the requirement, and comments detailing compliance status. The spreadsheet also addresses the requirements of Paragraph 144, Section IX, and includes designation of the applicable section of Paragraph 144 for which the information is being reported. This designation appears in the report spreadsheet column labeled "¶ 144 Reporting (a. – e.)". Attachments are also used to provide additional information.

A complete set of the six reports is being provided to EPA Headquarters. Copies of the appropriate individual refinery reports are being provided to the Applicable EPA Regions and Applicable State Agencies as described in Section XVII and additions requests from EPA and Illinois EPA.

Chief Environmental Enforcement Section

February 26, 2013

Page 2 of 6

I certify under penalty of law that this information was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my direction and my inquiry of the person(s) who manage the system, or the person(s) directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

If you have any questions, or require additional information, please contact me at 832-486-4903.

Sincerely,



David Hollis

Manager Environmental Services

Enclosures

Copies per Section XVII, Paragraph 270:

Covered Refineries

Certified # 7011 1570 0003b0286 6089
U.S. Environmental Protection Agency
Director, Air Enforcement Division
Office of Civil Enforcement
Ariel Rios Building, Mail Code 2242-A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460-0001

Manager, Environmental Services
CITGO
1293 Eldridge Parkway
Houston, TX 77077

General Counsel
CITGO
1293 Eldridge Parkway
Houston, TX 77077

Matrix New World Engineering Inc. *(via email only)*

Diana Lundelius of EPA *(via email only)*

Lake Charles Refinery

Certified # 7011 1570 0003 0286 6096
Chief
Air, Toxics, and Inspections Coordination Branch
Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Certified # 7011 1570 0003 0286 6102
Peggy M. Hatch
Administrator, Enforcement Division
Office of Environmental Compliance
Louisiana Department of Environmental Quality
P.O. Box 4312
Baton Rouge, LA 70821-4312

Lemont Refinery

Certified # 7011 1570 0003 0286 6119
Air and Radiation Division
U.S. EPA, Region 5
ATTN: Compliance Tracker
77 West Jackson Blvd. (AE-17J)
Chicago, IL 60602-3018

Certified # 7011 1570 0003 0286 6126
The State of Illinois
Office of the Illinois Attorney General
69 W. Washington St, 18th Floor
Chicago, IL 60602

Certified # 7011 1570 0003 0286 6133
Office of Regional Counsel
U.S. EPA, Region 5
77 West Jackson Blvd. (C-14J)
Chicago, IL 60604

Certified # 7011 1570 0003 0286 6140
Manager
Air Compliance Unit
Compliance and Enforcement Section (MC-40)
Bureau of Air
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, IL 62794-9276

Certified # 7011 1570 0003 0286 6157
Manager
Permit Section (MC-11)
Division of Air Pollution Control
Illinois Environmental Protection Agency
P.O. Box 19506
Springfield, IL 62794-9506

Certified # 7011 1570 0003 0286 6164
Manager
Air Regional Field Office
Division of Air Pollution Control
Illinois Environmental Protection Agency
9511 West Harrison
Des Plaines, IL 60016

Corpus Christi East Refinery and Corpus Christi West Refinery

Certified # 7011 1570 0003 0286 6171
Chief
Air, Toxics, and Inspections Coordination Branch
Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Savannah Refinery

Certified # 7011 1570 0003 0286 6188
Chief, Air Enforcement & EPCRA Branch
Air, Pesticides and Toxics Management Division
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, S.W.
Atlanta, GA 30303

Certified # 7011 1570 0003 0286 6195
Chief
Air Protection Branch
Environmental Protection Division
4244 International Parkway, Suite 120
Atlanta, GA 30354

Paulsboro Refinery

Certified # 7011 1570 0003 0286 6201
Director, Division of Enforcement and Compliance Assistance
U.S. Environmental Protection Agency, Region 2
21st Floor
290 Broadway
New York, NY 10007

Certified # 7011 1570 0003 0286 6218
Chief, Air Compliance Branch
Division of Enforcement and Compliance Assistance
21st Floor
290 Broadway
New York, NY 10007

Certified # 7011 1570 0003 0286 6225
New Jersey Department of Environmental Protection
Southern Regional Office
Air Compliance & Enforcement Manager
One Port Center
2 Riverside Drive, Suite 201
Camden, NJ 08103

cc:

Lee Liebendorfer – Lake Charles report
Mark Cheesman – Corpus Christi reports
James Tancredi – Lemont report
Janet Ferris – Paulsboro report
Dusty Crisler – Savannah report
Chris Newcomb – Legal
File: Semi-Annual Report, IX, 01-2012



CITGO Petroleum Corporation

Lemont Refinery

Semi-Annual Report

July 1, 2012 – December 31, 2012

Reference Case No. 90-5-2-1-07277

**CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 – December 31, 2012**

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**CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
January 1, 2012 – June 30, 2012**

Executive Summary

Pursuant to Section IX of the CITGO Petroleum Corporation Consent Decree (Civil Action Number H-04-3883 - Southern District of Texas) entered January 26, 2005, CITGO is submitting the Semi-Annual Report for the second half of 2012 for the Lemont Refinery in Lemont, Illinois. This report covers the period from July 1, 2012 through December 31, 2012.

The Semi-Annual Report consists of:

- A spreadsheet listing each applicable Consent Decree topic, Paragraph reference, due date, submittal or completion date, a description of the requirement, and comments detailing compliance status. The spreadsheet also addresses the requirements of Paragraph 144, Section IX, for each applicable Consent Decree paragraph and includes designation of the applicable section of Paragraph 144 for which the information is being reported. This designation appears in the report spreadsheet column labeled “¶ 144 Reporting (a. – e.).”
- A set of attachments that are used to provide additional information.

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
FCCU	12	Effective January 26, 2005	January 26, 2005 and Ongoing	Operate, calibrate and certify CEMS for NOx, O ₂ , SO ₂ , CO and opacity at FCCU. The CEMS shall be installed, calibrated and certified in accordance with 40 CFR 60.13 and Part 60 Appendices A and F, and the applicable performance specification test of 40 CFR Part 60 Appendix B.	a.	Complied with requirement.
FCCU	12	Effective December 31, 2007	December 31, 2007 and Ongoing	Operate, calibrate and certify PEMS for opacity at FCCU. The PEMS shall be operated, calibrated and certified in accordance with the approved alternative monitoring plan.	a.	Complied with requirement.
FCCU	12	Effective January 26, 2005	January 26, 2005 and Ongoing	For O ₂ , SO ₂ , NOx, and CO CEMS: In lieu of the requirements of 40 C.F.R. Part 60, Appendix F §§ 5.1.1, 5.1.3, and 5.1.4, may conduct: (1) either a Relative Accuracy Audit ("RAA") or a Relative Accuracy Test Audit ("RATA") once every three (3) years; and 2) a Cylinder Gas Audit ("CGA") each calendar quarter in which a RAA or RATA is not performed.	a.	Complied with requirement. CGA conducted 3rd and 4th quarters. A RATA was performed on the FCCU O ₂ , SO ₂ , and NOx CEMS during the 4th quarter of 2011. A RATA was also performed on the FCCU O ₂ and CO CEMS during the 3rd quarter of 2012.
FCCU	21	Effective December 31, 2007	December 31, 2007 and Ongoing	Convert the FCCU to full burn operation or accept and agree to comply with concentration based emission limit of 20 ppmvd on a 365-day rolling average and 40 ppmvd on a 7-day rolling average basis, both at 0% oxygen.	a.	Complied with Emission Limit Option at Paragraphs 30A; this explicitly absolves CITGO of any remaining obligations for the Lemont Refinery FCCU under Paragraphs 13 through 30 of the Consent Decree requirement.
FCCU	31	Effective December 31, 2007	December 31, 2007 and Ongoing	Use NOx and O ₂ CEMS to monitor performance and to report compliance.	a. & b.	Performance monitored. See Attachment 1 .
FCCU	41	Effective January 26, 2005	January 26, 2005 and Ongoing	Use SO ₂ and O ₂ CEMS to monitor performance and to report compliance.	a. & b.	Performance monitored. See Attachment 1 .
FCCU	44a	Effective December 31, 2007	December 31, 2007 and Ongoing	Install and commence operation of a WGS designed to achieve an emission limit of 0.5 pounds of PM per 1000 pounds of coke burned on a 3-hour average basis.	a. & b.	Complied with requirement.

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
FCCU	46	Effective December 31, 2007	December 31, 2007 and Ongoing	Comply with an emission limit of 1.0 pounds of PM per 1000 pounds of coke burned on a 3-hour average basis .	a., b. & d.	Complied with requirement based on the most recent Performance Test, July 2012. Test showed 0.25 lb PM/1000 lb coke burn. The FCCU was operated while the WESP was intermittently out of service during the period due to malfunction (the WGS continued to operate during this time). Performance Tests were conducted during a WESP malfunction period. The three tests conducted during September 2012 confirmed coke burn below the 1.0 lb PM/1000 lb coke burn with results in the range of 0.40 - 0.62 lb PM/1000 lb coke burn.
FCCU	47	Initially 3/31/2008 and Annually Thereafter	March 18, 2008	Conduct annual PM stack tests.	a. & d.	Complied with requirement. Most recent stack test completed July 2012. Next stack test due third quarter 2013.
FCCU	48	Effective January 26, 2005	January 26, 2005 and Ongoing	Comply with 100ppmvd CO corrected to 0% O2 on a 365-day rolling average basis and 500ppmvd CO corrected to 0% O2 on a 1-hour average basis at FCCU.	a. & b.	Complied with requirement. See Attachment 1 .
FCCU	50	Effective January 26, 2005	January 26, 2005 and Ongoing	Beginning on the dates set forth in Paragraph 12, shall use CO and O2 CEMS to monitor performance and report compliance with terms and conditions of Consent Decree.	a. & b.	Complied with requirement. See Attachment 1 .
FCCU	51	Effective January 26, 2005	January 26, 2005 and Ongoing	FCCU Regenerator shall be an "affected facility" per NSPS Subparts A & J. Comply with requirements of NSPS Subparts A & J for CO on FCCU.	a., b. & d.	Complied with requirement. See Attachment 1 .
FCCU	51	Effective December 31, 2007	December 31, 2007 and Ongoing	FCCU Regenerator shall be an "affected facility" per NSPS Subparts A & J. Comply with requirements of NSPS Subparts A & J for SO2 on FCCU.	a., b. & d.	Complied with requirement. See Attachment 1 .
FCCU	51	Effective December 31, 2007	December 31, 2007 and Ongoing	FCCU Regenerator shall be an "affected facility" per NSPS Subparts A & J. Comply with requirements of NSPS Subparts A & J for PM on FCCU.	a., b. & d.	Complied with requirement based on the most recent Performance Test, July 2012. Test showed 0.25 lb PM/1000 lb coke burn.

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
Heaters & Boilers	56	Initial submittal by March 31, 2005 and Annually thereafter by February 28 of each year	February 28, 2006 and by February 28 of each year thereafter	Shall submit a detailed NOx Control Plan ("Control Plan") to EPA for review and comment by no later than March 31, 2005, with annual updates (covering the prior calendar year) with the first report submitted pursuant to Section IX (Record-keeping and Reporting) following the passage of each calendar year until termination of the Consent Decree or until the reductions required by Paragraph 54 are achieved, whichever occurs first. The Control Plan and its updates shall describe the achieved and anticipated progress of the NOx emissions reductions program for heaters and boilers and shall contain the information requested in this Paragraph.	a., b. & e.	Complied with requirement. The final annual update of the plan, reflecting the installation and testing of all Required Qualifying Controls, was submitted in Attachment 2 of the February 2012 report. See also Attachment 2, which re-states that the Final Report was submitted in February 2012..
Heaters & Boilers	57	June 30, 2011	June 30, 2011	Consistent with Paragraph 54, CITGO shall install the remainder of the required Qualifying Controls by no later than June 30, 2011	a.	All Required Qualifying Controls installed per Appendix C. The last of the qualifying controls at Lemont Refinery were installed in May, 2011 (116B-1 and 116B-2).
Heaters & Boilers	59	September 30, 2005	September 30, 2005 and Ongoing	By no later than September 30, 2005, CITGO shall implement the specified monitoring requirements (CEMS, PEMS, stack test) based on the capacity of the heaters or boiler as listed in Appendix C for units that utilize Qualifying Controls as of the Date of Lodging and which CITGO intends to use to achieve the NOx reductions required by Paragraph 54.	a.	Complied with requirement. Paragraph 59a requires the following MMBtu/hr heat inputs > 150 : CEMS 100 < HI < 150: CEMS or PEMS < 100: CEMS, PEMS, or stack test. Units w/ qualifying controls by the Date of Lodging include: - 111B-1A, B-1B, and B-2. (CEMS installed by September 2005.) Units w/ qualifying controls installed after the Date of Lodging include: <u>Qualifying control installed 2006:</u> - 430B-1 (CEM installed 2003) <u>Qualifying controll installed May 2011 on heaters < 100 MMBtu/hr</u> - 116B-1 (October 2011 stack test) - 116B-2 (October 2011 stack test)

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
Heaters & Boilers	60	September 30, 2005	September 30, 2005 and Ongoing	Shall install, certify, calibrate, maintain, and operate the CEMS required by Paragraph 59 in accordance with 40 C.F.R. Part 60, Appendices A and F, and the applicable performance specification test of 40 C.F.R. Part 60, Appendix B. However, in lieu of the requirements of 40 C.F.R. Part 60, Appendix F §§ 5.1.1, 5.1.3 and 5.1.4, CITGO may conduct either a Relative Accuracy Audit ("RAA") or a Relative Accuracy Test Audit ("RATA") once every three (3) years and shall conduct Cylinder Gas Audits ("CGA") each calendar quarter during which a RAA or a RATA is not performed.	a.	Complied with requirement. CGA conducted each calendar quarter during which a RAA or a RATA is not performed.
Heaters & Boilers	64a	Effective January 26, 2005	January 26, 2005 and Ongoing	Comply with NSPS requirements of Subparts A and J for fuel gas combustion devices except those listed in Appendix E of Consent Decree.	a., b., & d.	Complied with requirement except as noted in Attachment 3 .
Heaters & Boilers	64a	Effective July 31, 2005	July 31, 2005 and Ongoing	Heaters and boilers listed in Appendix E shall be an "affected facility" and shall be subject to and comply with the requirements of NSPS Subparts A and J for fuel gas combustion devices by the dates listed in Appendix E.	a.	Complied with requirement.
Heaters & Boilers	64a	Effective October 31, 2005	October 31, 2005 and Ongoing	Heaters and boilers listed in Appendix E shall be an "affected facility" and shall be subject to and comply with the requirements of NSPS Subparts A and J for fuel gas combustion devices by the dates listed in Appendix E.	a.	Complied with requirement.
Heaters & Boilers	65	Effective January 26, 2005	January 26, 2005 and Ongoing	Discontinue use of fuel oil in any combustion unit except for periods of Natural Gas Curtailment. Nothing herein is intended to limit, or shall be interpreted as limiting, the use of torch oil during FCCU Startups.	a. & d.	Complied with requirement. Further, this paragraph is not intended to be interpreted to limit the use of torch oil in an FCCU regenerator to assist in starting, restarting, maintaining hot standby, or maintaining regenerator heat balance.
SRP	67b	Effective January 1, 2009	January 1, 2009 and Ongoing	NSPS Subparts A & J applicable to Claus Trains A and B.	a.	Complied with requirement.
SRP	67c	Effective January 26, 2005	January 26, 2005 and Ongoing	NSPS Subparts A & J applicable to Claus Trains C and D.	a.	Complied with requirement.
SRP	68a	Effective January 1, 2009	January 1, 2009 and Ongoing	Claus Trains A & B must comply with provisions applicable under NSPS Subparts A & J.	a.	Complied with requirement.
SRP	68a	Effective January 26, 2005	January 26, 2005 and Ongoing	Claus Trains C & D must comply with provisions applicable under NSPS Subparts A & J.	a.	Complied with requirement.

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
SRP	68b	Effective January 1, 2009	January 1, 2009 and Ongoing	Monitor all tail gas emission points (stacks) and report excess emissions from each SRP pursuant to 40 CFR 60.7(c), 60.13 and 60.105(a)(6). Trains A & B.	a. & b.	Complied with requirement except as noted in Attachment 4 .
SRP	68b	Effective January 26, 2005	January 26, 2005 and Ongoing	Monitor all tail gas emission points (stacks) and report excess emissions from each SRP pursuant to 40 CFR 60.7(c), 60.13 and 60.105(a)(6). Trains C & D.	a. & b.	Complied with requirement except as noted in Attachment 4 .
SRP	69a	Effective January 1, 2009	January 1, 2009 and Ongoing	Install one or more TGU(s) to control emissions from Claus Trains 119 A and B.	a.	Complied with requirement.
SRP	73a	February 28, 2005	February 28, 2005 and Ongoing	Summarize and report changes to the Preventative Maintenance and Operaton Plan (PMO) in semi-annual report.	a. & e.	Complied with requirement. See Attachment 5 for summary of changes.
HC Flaring	74	Effective January 26, 2005	January 26, 2005 and Ongoing	Implement good air pollution control practices to minimize emissions from flare devices.	a.	Complied with requirement.
HC Flaring	75a.i.	Effective January 26, 2005	Effective January 26, 2005	Flares 844C-1, 844C-2, 844C-3 and 844C-4 must meet requirements of NSPS Subparts A & J by option (i) operating and maintaining a flare gas recovery system to prevent continuous or routine combustion in the NSPS HC flaring device.	a.	Flares 844C-1, 844C-2, 844C-3, and 844C-4 are equipped with flare gas recovery systems. Other than when the Flare gas recovery system for C-2 and C-3 was down for maintenance, and when that compressor was shutdown to repair a line leak, all systems were operated throughout the reporting period.

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
HC Flaring	76a	Effective January 26, 2005	January 26, 2005 and Ongoing	For continuous or intermittent, routinely-generated refinery gases that are combusted in any of the NSPS Hydrocarbon Flaring Devices, CITGO shall comply with the emission limit at 40 C.F.R 60.104(a)(1) by the dates specified in Appendix G.	a.	Complied with requirement. Flares 844C-1, 844C-2, 844C-3, and 844C-4 are equipped with flare gas recovery systems, and combusted gases only associated with refinery process unit startups and shutdowns as well as other refinery malfunctions. These flares do not combust continuous or intermittent routinely generated gases, unless other refinery equipment malfunctions. Flare 844C-5 is dedicated to a HF alkylation unit, is not equipped with flare gas recovery, and sees routinely generated gases. The Alternative Monitoring Program (AMP) conducted in 2005-6 for various 844C-5 flare gas scenarios showed no H ₂ S. Also, per 40CFR 60.105(a)(4)(iv)(C), fuel gas produced at HF alkylation units is inherently low in sulfur and does not require monitoring for H ₂ S.
HC Flaring	76b	Effective January 26, 2005	January 26, 2005 and Ongoing	The combustion of gases generated by the Startup, Shutdown, or Malfunction of a refinery process unit or released to an NSPS Flaring Device as a result of relief valve leakage or other emergency Malfunction are exempt for the requirements to comply with 40C.F.R. 60.104(a)(1).	a.	Complied with requirement. During the reporting period flares 844C-1, 844C-2, 844C-3, and 844C-4, all equipped with flare gas recovery systems, combusted gases associated with refinery process unit startups and shutdowns as well as other refinery malfunctions.
AG Flaring/Tail Gas Incident	78	Effective January 26, 2005	January 26, 2005 and Ongoing	Investigate Acid Gas Flaring and Tail Gas Incidents, correct conditions that caused incident, and minimize incidents.	a.	One Acid Gas Flaring Incident and one Tail Gas Incident occurred during the reporting period. Both occurred on December 2, 2012.
AG/TG Flaring	79	45 days following the end of an acid gas flaring incident	N/A	No later than 45 days following the end of an Acid Gas Flaring Incident, an investigative report shall be submitted.	a.	One Acid Gas Flaring Incident occurred during the reporting period on December 2, 2012. The investigative report was submitted on January 15, 2013, which was 44 days after the end of the flaring event.

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
AG Flaring/Tail Gas Incident	79	45 days following the end of a Tail Gas Incident	N/A	No later than 45 days following the end of a Tail Gas Incident, an investigative report shall be submitted.	a.	One Tail Gas Incident occurred during the reporting period beginning on December 2, 2012. The event ended on December 3, 2012, and the investigative report was submitted on January 17, 2013, which was 45 days after the end of the Incident.
AG Flaring/Tail Gas Incident	80a	Effective January 26, 2005	N/A	Take corrective actions to minimize likelihood of a recurrence of the Root Cause and all significant contributing causes of AG Flaring Incident.	a.	One Acid Gas Flaring Incident occurred during the reporting period on December 2, 2012. See the investigative report submitted on January 15, 2013, for corrective actions.
AG Flaring/Tail Gas Incident	80a	Effective January 26, 2005	N/A	Take corrective actions to minimize likelihood of a recurrence of the Root Cause and all significant contributing causes of Tail Gas Incident.	a.	One Tail Gas Incident occurred during the reporting period beginning on December 2, 2012. See the investigative report submitted on January 17, 2013 for corrective actions.
AG Flaring/Tail Gas Incident	80b	Effective January 26, 2005	N/A	If EPA does not notify CITGO in writing within 45 days of receipt of reports required by Paragraph 79 that it objects to proposed corrective actions and schedules, then those actions and schedules shall be deemed acceptable for compliance with Paragraph 80a.	a.	One Acid Gas Flaring Incident occurred during the reporting period on December 2, 2012. See the investigative report submitted on January 15, 2013, for corrective actions. No notification from EPA of objection to the proposed corrective actions and schedules has been received.
AG Flaring/Tail Gas Incident	80b	Effective January 26, 2005	N/A	If EPA does not notify CITGO in writing within 45 days of receipt of reports required by Paragraph 79 that it objects to proposed corrective actions and schedules, then those actions and schedules shall be deemed acceptable for compliance with Paragraph 80a.	a.	One Tail Gas Incident occurred during the reporting period beginning on December 2, 2012. See the investigative report submitted on January 17, 2013 for corrective actions. No notification from EPA of objection to the proposed corrective actions and schedules has been received.

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
AG Flaring/Tail Gas Incident	80c.	Effective January 26, 2005	N/A	If EPA objects to the proposed corrective actions and/or schedule of implementation, it shall notify CITGO and explain basis, and CITGO shall respond promptly to EPA's objection.	e.	One Acid Gas Flaring Incident occurred during the reporting period on December 2, 2012. See the investigative report submitted on January 15, 2013, for corrective actions. No notification from EPA of objection to the proposed corrective actions and schedules has been received.
AG Flaring/Tail Gas Incident	80c.	Effective January 26, 2005	N/A	If EPA objects to the proposed corrective actions and/or schedule of implementation, it shall notify CITGO and explain basis, and CITGO shall respond promptly to EPA's objection.	e.	One Tail Gas Incident occurred during the reporting period beginning on December 2, 2012. See the investigative report submitted on January 17, 2013 for corrective actions. No notification from EPA of objection to the proposed corrective actions and schedules has been received.
AG/TG Flaring	93a	Effective January 26, 2005	N/A	For Tail Gas Incidents, CITGO shall follow the same investigative, reporting, corrective action and assessment of stipulated penalty procedures as those set forth in Paragraphs 79 through 91 for Acid Gas Flaring Incidents. No later than 45 days following the end of a Tail Gas Incident, an investigative report shall be submitted.	a.	One Tail Gas Incident occurred during the reporting period beginning on December 2, 2012. See the investigative report submitted on January 17, 2013 (45 days after the end of the incident), which addressed corrective actions and assessed the stipulated penalty procedures of Paragraphs 79-91.
HC Flaring	94	Effective January 26, 2005	Each Semi-Annual Report	Hydrocarbon Flaring Incidents shall be investigated, reported, and corrective action taken, according to paragraphs 79 - 80 with certain exceptions. Investigative report to be completed within 45 days following incident. Investigative report to be submitted as part of Semi-Annual Report.	a. & e.	Hydrocarbon Flaring Incidents occurred August 7, August 10, September 20, October 1, October 21-22, November 3-10, and November 10-25, 2012. See Attachment 6 .
BWON	96a	Effective January 26, 2005	January 26, 2005 and Ongoing	Comply with 6BQ Compliance Option.	a.	Complied with requirement. YTD BQ is below 6 Mg.

CITGO Petroleum Corporation
Lemont Refinery
Semi-Annual Report
July 1, 2012 - December 31, 2012

Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
BWON	101a	Effective January 26, 2005	January 26, 2005 and Ongoing	Continue to use primary and secondary carbon canisters as control device under Benzene Waste NESHAP and operate them in series where such systems are in use as of January 26, 2005. Maintain a complete, accurate and up to date list which includes location of the canisters and whether VOC or benzene is used to monitor for breakthrough.	a.	Complied with requirement.
BWON	101b	Effective January 26, 2005	January 26, 2005 and Ongoing	For carbon canisters, do not use single carbon canisters for any new units or installations requiring controls.	a.	Complied with requirement.
BWON	101c	Effective January 26, 2005	January 26, 2005 and Ongoing	For dual carbon canister systems, breakthrough between the primary and secondary canister is equal to or greater than 50 ppm volatile organic compounds (VOC).	a.	Complied with requirement.
BWON	101d	Effective January 26, 2005	January 26, 2005 and Ongoing	Monitor for breakthrough between the primary and secondary carbon canisters monthly.	a.	Complied with requirement.
BWON	101e	Effective January 26, 2005	January 26, 2005 and Ongoing	The original carbon canister shall be replaced immediately when breakthrough is detected between the primary and secondary canister. Immediately means within twelve hours for canisters 55 gallons and less and within twenty four hours for canisters greater than 55 gallons.	a.	Complied with requirement.
BWON	101f	October 31, 2004	N/A	Monitor for breakthrough on temporary carbon canisters each day canister is in use.	a.	No temporary applications used during period.
BWON	101g	Effective January 26, 2005	January 26, 2005 and Ongoing	Maintain a readily available supply of fresh carbon canisters to implement "immediate" change-out when breakthrough occurs.	a.	Complied with requirement.
BWON	101h	Effective January 26, 2005	January 26, 2005 and Ongoing	Maintain records for carbon canisters, which includes monitor readings and constituents being monitored for at least five years.	a.	Complied with requirement. Records maintained in LDAR database.
BWON	102	May 31, 2005	May 31, 2005 and Ongoing	Establish or modify a written management of change procedure to provide for annual review of process information relating BWON waste streams.	a.	Complied with requirement.
BWON	102	Effective May 31, 2005	May 31, 2005 and Annually, thereafter	Per BWON Management of Change Procedures, conduct an annual review of process information, including construction projects, to locate new benzene waste streams for inclusion into the waste stream inventory.	a.	Complied with requirement.
BWON	103a	Effective September 30, 2005	September 30, 2005 and ongoing	Conduct initial audits of laboratories that perform analyses of BWON samples.	a.	No initial laboratory audits conducted this reporting period. Initial laboratory audits were conducted August and September 2005.

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BWON	103c	Effective September 30, 2007	September 30, 2007 and ongoing	Conduct subsequent audits of laboratories that perform analyses of BWON samples such that each laboratory is audited every two years.	a.	Complied with requirement. No audits were completed during this reporting period. The most recent audits were completed 2nd half of 2011 (summaries were in Attachment 7, Appendix A of report submitted February 2012). See also Attachment 7, Appendix A.
BWON	104	Effective January 26, 2005	September, 2005 and every 2 yrs thereafter	Review all spills to determine if any benzene waste was generated. Any release of more than 10 pounds in a 24 hour period shall be included in the TAB and BQ.	a.	Complied with requirement.
BWON	105a	Effective May 31, 2005	N/A	Develop and begin implementation of annual training for employees who draw benzene waste samples for BWON purposes.	a.	Refinery employees involved in drawing benzene waste samples for BWON purposes were trained as part of their annual BWON Training.
BWON	105b	Effective December 31, 2005	December 31, 2005 and Ongoing	Shall complete an initial training program on the standard operating procedures for all control devices and treatment processes used to comply with the Benzene Waste NESHAP for all operators assigned to applicable control devices and treatment processes. Comparable training shall also be provided to any persons who subsequently become operators, prior to their assumption of this duty.	a.	Complied with requirement.
BWON	105d	May 31, 2005	May 31, 2005 and Ongoing	CITGO shall assure that the employees of any contractors hired to perform any of the requirements of Section V.L of this Consent Decree (i.e., Benzene Waste NESHAP Program Enhancements) are properly trained to implement such requirements that they are hired to perform, as under Paragraph 105.a and b above.	a.	Complied with requirement. See explanations in Paragraph 112b.
BWON	107c	4th Quarter 2005	4th Quarter 2005 and Ongoing	Begin sampling under the EOL plan.	a.	Complied with requirement.
BWON	109	To be initiated in 4th Quarter 2005	Initiated in 4th Quarter 2005 and Ongoing	At the end of the calendar quarter following commencement of quarterly sampling, calculate a quarterly uncontrolled benzene quantity and estimate a projected calendar year uncontrolled benzene quantity based on quarterly EOL sampling results, non-EOL sampling results and approved flow calculations.	a.	Complied with requirement. See Attachment 7. Based on 3rd and 4th quarter EOL sampling, BQ estimate for 2012 is 0.46 MT.
BWON	111d	Effective January 26, 2005	Effective January 26, 2005	Conduct quarterly monitoring and repair of the oil water separators .	a.	Complied with requirement.

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BWON	112a	Effective Semi-annually after initial audit	Semi-Annually	Submit to EPA information in the progress report(s) pursuant to Paragraph 144 for the six month period covered by the report. An identification of all laboratory audits, if any, completed during the six month period, including a description of the methods used in the audit and the results of the audit.	a. & e.	No laboratory audits were conducted during this reporting period. The most recent audits were completed 2nd half of 2011 (summaries were in Attachment 7, Appendix A of report submitted February 2012). The next audits required by Paragraph 103c will be conducted in 2013. See Attachment 7, Appendix A for requested information.
BWON	112b	Effective May 31, 2005	May 31, 2005 and Semi-annually, thereafter	Submit to EPA information in the progress report(s) pursuant to Paragraph 144 for the six month period covered by the report: A description of the measures taken, if any, during the six month period to comply with the training provisions of Paragraph 105. Paragraph 105a states: Provide annual (i.e., once each calendar year) training for all employees who draw benzene waste samples for Benzene Waste NESHAP purposes.	a. & e.	Updated annual Employee BWON Training, included additional detail for BWON sampling requirements.
BWON	112b	Effective December 31, 2005 (See Paragraph 105b)	Semi-Annually	Submit to EPA information in the progress report(s) pursuant to Paragraph 144 for the six month period covered by the report: A description of the measures taken, if any, during the six month period to comply with the training provisions of Paragraph 105. Paragraph 105b states: Shall complete an initial training program on the standard operating procedures for all control devices and treatment processes used to comply with the Benzene Waste NESHAP for all operators assigned to applicable control devices and treatment processes. Comparable training shall also be provided to any persons who subsequently become operators, prior to their assumption of this duty.	a. & e.	Complied with requirement.

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Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
BWON	112b	Effective December 31, 2005	Semi-Annually	Submit to EPA information in the progress report(s) pursuant to Paragraph 144 for the six month period covered by the report: A description of the measures taken, if any, during the six month period to comply with the training provisions of Paragraph 105. Paragraph 105 d states: CITGO shall assure that the employees of any contractors hired to perform any of the requirements of Section V.L of this Consent Decree (i.e., Benzene Waste NESHAP Program Enhancements) are properly trained to implement such requirements that they are hired to perform, as under Paragraph 105.a and b above.	a. & e.	No training was conducted during this reporting period. The most recent contractor training occurred May 30, 2012. Training entailed a detailed review of USEPA Method 25D and EOL Plan for BWON Sampling.
BWON	112c	Effective January 26, 2005	Semi-Annually	Submit to EPA information in the progress report(s) pursuant to Paragraph 144 for the six month period covered by the report: A summary of the sampling results required under Paragraphs 107, including the quarterly and projected annual uncontrolled benzene quantities or TABs, as applicable.	a. & e.	3rd and 4th quarter BWON EOL calculations performed. See Attachment 7 . Based on the 3rd and 4th quarter BWON EOL values, BQ estimate for 2012 is 0.46 Mg.
LDAR	115	Effective April 30, 2005	Semi-Annually	Develop and maintain a written program for compliance with applicable federal and state LDAR regulations.	a.	Complied with requirement.
LDAR	116a	May 31, 2005	May 31, 2005 and Ongoing	For personnel newly-assigned to LDAR responsibilities, require training prior to each employee beginning such work.	a.	Complied with requirement.
LDAR	116b	September 30, 2005	September 30, 2005 and Ongoing	Complete required initial annual training for all personnel assigned LDAR responsibilities.	a.	Complied with requirement.
LDAR	116b	Effective September 30, 2005	September 30, 2005 and Annually thereafter	For all personnel assigned LDAR responsibilities, shall provide and require completion of annual LDAR training.	a.	Complied with requirement. System in place for next required annual training.
LDAR	116c	September 30, 2005	September 30, 2005 and Ongoing	Complete required initial annual training for all other operations and maintenance personnel (including contract personnel) that includes instruction on aspects of LDAR that are relevant to the person's duties.	a.	Complied with requirement.
LDAR	116c	Effective September 30, 2005	September 30, 2005 and Annually thereafter	For all other operations and maintenance personnel (including contract personnel), shall provide and require completion of annual "Refresher" training that includes instruction on aspects of LDAR that are relevant to the person's duties.	a.	Complied with requirement. Training conducted throughout the year.

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Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
LDAR	116d	Effective September 30, 2005	September 30, 2005 and Annually thereafter	CITGO shall assure that contract employees that perform LDAR work comply with annual LDAR training requirements of Paragraph 116. a.-c.	a.	Complied with requirement.
LDAR	116d for 116a	Effective May 31, 2005	May 31, 2005 and Ongoing	For contract employees performing LDAR work, shall assure that contractor complies with Subparagraph 116.a by requiring contractor to provide training for personnel newly assigned to LDAR responsibilities. Training to be completed prior to beginning such work. Contractor shall provide its training information and records to CITGO.	a.	Complied with requirement. Training conducted throughout the year.
LDAR	116d for 116b	September 30, 2005	September 30, 2005 and Ongoing	For contract employees performing LDAR work, shall assure that contractor complies with the training requirements in Subparagraphs 116.b by completing required initial annual training for all personnel assigned LDAR responsibilities. Contractor shall provide its training information and records to CITGO.	a.	Complied with requirement.
LDAR	116d for 116b	Effective September 30, 2005	September 30, 2005 and Annually thereafter	For contract employees performing LDAR work, shall assure that contractor complies with the training requirements in Subparagraphs 116.b by requiring contractor to provide annual training for all personnel assigned LDAR responsibilities. Contractor shall provide its training information and records to CITGO.	a.	Complied with requirement. System in place to meet ongoing requirement.
LDAR	116d for 116c	September 30, 2005	September 30, 2005 and Ongoing	For contract employees performing LDAR work, shall assure that contractor complies with the training requirements in Subparagraphs 116.c by completing required initial annual training for all other contract operations and maintenance personnel that includes instruction on aspects of LDAR that are relevant to the person's duties. Contractor shall provide its training information and records to CITGO.	a.	Complied with requirement.
LDAR	116d for 116c	Effective September 30, 2005	September 30, 2005 and Annually thereafter	For contract employees performing LDAR work, shall assure that contractor complies with the training requirements in Subparagraphs 116.c by requiring contractor to provide annual 'refresher' training for all other contract operations and maintenance personnel that includes instruction on aspects of LDAR that are relevant to the person's duties. Contractor shall provide its training information and records to CITGO.	a.	Complied with requirement. System in place to meet ongoing requirement.

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LDAR	117	September 30, 2005	September, 2005 and every two years thereafter	Conduct an audit to ensure compliance with all applicable LDAR requirements.	a.	No 3rd party LDAR audit was conducted during this quarter. The most recent 3rd party LDAR audit was conducted in the 2nd half of 2011, as indicated in the February 2012 report. See also Attachment 9, Appendix F.
LDAR	118	Initially in semi-annual report post September 30, 2005 and semi-annually thereafter	February 28, 2007 and semi-annually thereafter	Submit a summary, including findings, of the audit report and a list of corrective actions taken during the reporting period.	a. & e.	Complied with requirement. See Attachment 9, Appendix F for requested information.
LDAR	118	Ongoing after November 29, 2005	Ongoing	If the results of any of the audits conducted pursuant to Paragraph 117 identify any areas of noncompliance, CITGO shall implement, as soon as practicable, all steps necessary to correct or otherwise address such area(s) of non-compliance and to prevent a recurrence of the cause of that non-compliance, to the extent practicable.	a. & e.	Complied with requirement. See Attachment 9, Appendix F for requested information.
LDAR	118	Ongoing after November 29, 2005	Ongoing	For the life of the Consent Decree, CITGO shall retain the audit reports generated pursuant to Paragraph 117 and shall maintain a written record of all corrective actions that CITGO takes in response to deficiencies identified in any audits.	a.	Complied with requirement.
LDAR	119a	February 28, 2006	February 28, 2006 and Ongoing	Utilize an internal leak threshold of 500 ppm VOCs for valves. Excludes pressure relief valves.	a.	Complied with requirement.
LDAR	119b	February 28, 2006	February 28, 2006 and Ongoing	Utilize an internal leak threshold of 2000 ppm VOCs for pumps.	a.	Complied with requirement.
LDAR	120a	February 28, 2006	February 28, 2006 and Ongoing	For regulatory purposes, CITGO may continue to report leak rates in valves and pumps against the applicable regulatory leak definition, or may use the lower, internal leak definitions specified in Paragraph 119.	a.	For regulatory purposes, leak rates against the applicable regulatory leak definition are reported.

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LDAR	120b	February 28, 2006	February 28, 2006 and Ongoing	Begin recording, tracking, repairing and re-monitoring all leaks in excess of the internal leak definitions of Paragraph 119 at such time as those definitions become applicable. Make a first attempt to repair and re-monitor leaks within five (5) days of identification. Within thirty (30) days of identification, shall either complete repairs and re-monitoring of leaks or place such component on the delay of repair list pursuant to Paragraph 128.	a. & d.	Complied with requirement except as reported in 130b.ix in Attachment 8 .
LDAR	121a	February 28, 2006	February 28, 2006 and Ongoing	Monitor pumps at the internal leak threshold monthly.	a.	Complied with requirement.
LDAR	121b	February 28, 2006	February 28, 2006 and Ongoing	Monitor valves at the internal leak threshold quarterly.	a.	Complied with requirement.
LDAR	122	September 30, 2005	September 30, 2005 and Ongoing	Make an "initial attempt" to repair valves with a reading greater than 200ppm of VOCs. The "initial attempt" at repair and remonitoring must be conducted within 5 days of identification.	a.& d.	Complied with requirement except as reported per 130b.viii. In Attachment 8 .
LDAR	123a	Effective January 26, 2005	January 26, 2005 and Ongoing	Continue to maintain an electronic database for storing and reporting LDAR data.	a.	Complied with requirement.
LDAR	123b	Effective December 31, 2004	December 31, 2004 and Ongoing	Use data loggers and/or other electronic data collection devices during all LDAR monitoring and use best efforts to transfer data daily. Some use of paper logs is allowed provided manually recorded monitoring data is transferred to the electronic data base within 7 days of the monitoring event.	a.	Complied with requirement.
LDAR	124 Subparag. a.	Effective January 26, 2005	January 26, 2005 and Ongoing	Shall have developed and begun implementing procedures for quality assurance/quality control ("QA/QC") reviews of all data generated by LDAR monitoring technicians such that monitoring data is reviewed for QA/QC by the monitoring technicians daily after collection.	a.	Complied with requirement.
LDAR	124 Subparag. b.	Effective January 26, 2005	Quarterly January 26, 2005 and Ongoing	Shall have developed and begun implementing procedures for quality assurance/quality control ("QA/QC") reviews of all data generated by LDAR monitoring technicians such that all monitoring data is subject to a QA/QC review at least once per quarter, including but not limited to the number of components monitored per technician, time between monitoring events, and abnormal data patterns.	a.	Complied with requirement.

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Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
LDAR	127a	Effective January 26, 2005	January 26, 2005 and Ongoing	Conduct calibrations of LDAR monitoring equipment as outlined in Test Method 21.	a.	Complied with requirement.
LDAR	127b	Effective January 26, 2005	January 26, 2005 and Ongoing	Conduct calibration drift assessment at the end of each monitoring shift.	a.	Complied with requirement.
LDAR	127c	Effective January 26, 2005	January 26, 2005 and Ongoing	Maintain records of instrument calibrations for a period of one year following the date of calibration.	a.	Complied with requirement.
LDAR	128a	February 28, 2006	February 28, 2006 and Ongoing	Delay of repair list requires unit supervision sign-off within 30 days of identifying that a piece of equipment is leaking greater than the applicable leak definition and such equipment is technically infeasible to repair without process unit shutdown.	a.	Complied with requirement.
LDAR	128b	February 28, 2006	February 28, 2006 and Ongoing	Include equipment, placed on "delay of repair," on regular LDAR monitoring as required by Paragraph 121.	a.	Complied with requirement.
LDAR	128c	February 28, 2006	February 28, 2006 and Ongoing	Use "drill and tap" method, other than on a control or pressure relief valve, if it is leaking at a rate of 10,000 ppm or greater, unless it can be demonstrated that there is a safety, mechanical or major environmental concern posed by repairing the leak in this manner. If necessary, perform two "drill and taps" within 30 days of detecting the leak.	a.	Complied with requirement.
LDAR	128d	February 28, 2006	February 28, 2006 and Ongoing	Use best efforts to isolate and repair pumps identified as leaking at a rate of 2,000 ppm or greater.	a.	Complied with requirement.
LDAR	128e	Effective February 28, 2006	February 28, 2006 and Ongoing	Shall take the following actions for any equipment at the Refinery that CITGO intends to place on the "delay of repair" list, under applicable regulations: If a new method develops that is similarly effective as the "drill and tap" method for repairing non-control valves, CITGO will advise EPA and IEPA prior to implementing such new methods.	a.	Complied with requirement. No new methods developed during this reporting period.
LDAR	129	Effective February 28, 2006	February 28, 2006 and Ongoing	Replace, repack, or perform similarly effective repairs on chronically leaking, non-control valves during the next process turnaround after identification.	a.	Complied with requirement.
LDAR	130a.ii.	Semi-Annual Report after February 28, 2006 [August 31, 2006]	February 28, 2006 and Ongoing	Include the following information in the Semi-Annual Progress Report: Notification that the lower leak definitions and increased monitoring frequencies have been implemented according to Paragraphs 119 and 121.	a. & e.	Complied with requirement. The lower leak definitions and increased monitoring frequencies have been implemented according to Paragraphs 119 and 121.

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Consent Decree Topic	Paragraph Reference	Due Date	Submittal/ Completion Date	Requirement Description	¶ 144 Reporting (a. - e.)	Comments
LDAR	130a.viii.	Semi-Annual Report after February 28, 2006 [August 31, 2006]	February 28, 2006 and Ongoing	Shall include the following information in the Semi-Annual Progress Report: Notification that the "delay of repair" procedures under Paragraph 128 have been implemented.	a. & e.	Complied with requirement. The "delay of repair" procedures under Paragraph 128 have been implemented.
LDAR	130b.i. thru 130b.vi.	Each Semi-Annual Report	February 28, 2012	In each Semi-Annual Progress Report, shall also include the following information: a list of the process units monitored during the reporting period; the number of valves and pumps present in each process unit; the number of valves and pumps monitored in each process unit; the number of valves and pumps found leaking; the number of "difficult to monitor" pieces of equipment monitored; the projected month and year of the next monitoring event for that unit.	a. & e.	Complied with requirement. See Attachment 9 for summary of 130(b)(i) to (vi). See Attachment 9, Appendix A for DTM equipment. See Attachment 9, Appendix B for Monitoring Schedule 130(b)(vi).
LDAR	130.b.vii.	Each Semi-Annual Report after February 28, 2006 [August 31, 2006]	February 28, 2012	In each Semi-Annual Progress Report, a list of all equipment currently on the "delay of repair" list, the date each component was determined to be leaking at a rate greater than 10,000 ppm, the date of each drill and tap or equivalent method of repair, the associated monitoring results, and whether such activities were completed in a timely manner under Paragraph 128.	a. & e.	Complied with requirement. See Attachment 9, Appendix C for requested information.
LDAR	130.b.viii	Each Semi-Annual Report after September 30, 2005 [February 28, 2006]	February 28, 2012	In each Semi-Annual Progress Report, shall also include the following information: the number, date and results of each initial attempt at repair, including a list of all initial attempts/remonitoring that did not occur in a timely manner under Paragraph 122.	a. & e.	Complied with requirement. See Attachment 9, Appendix D for requested information.
LDAR	130.b.ix	Each Semi-Annual Report after February 28, 2006 [August 31, 2006]	February 28, 2012	In each Semi-Annual Progress Report, shall also include all instances of failure to comply with the requirements in Paragraph 120b.	a. & e.	Complied with requirement. See Attachment 9, Appendix E for requested information.
Permitting	132	Varies	As Applicable	Within thirty (30) days after the effective date or establishment of any emission limits and/or standards under Section V of this Consent Decree, shall submit applications to the IEPA to incorporate those emission limitations and/or standards into air permits (other than Title V permits) which are federally enforceable unless such permits with such limits have already been issued or applied for. Shall file any applications necessary to incorporate the requirements of those permits into the Title V permits of the Refinery.	a.	Complied with requirement.

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Recordkeeping and Reporting	144b	Each Semi-Annual Report	Semi-Annually	Submit a summary of the emissions data, including a separate identification of any exceedance(s), as required by Section V, for the six (6) month period covered by the report.	b.	Complied with requirement. See Attachment 10 for requested information.
Recordkeeping and Reporting	144c	Each Semi-Annual Report	Semi-Annually	Submit a description of any problems anticipated with respect to meeting the requirements of Section V of this Consent Decree.	c.	No problems anticipated with meeting requirements.
Recordkeeping and Reporting	144d	Each Semi-Annual Report	Semi-Annually	Discuss any such matters as CITGO believes should be brought to the attention of IEPA and EPA.	d.	Complied with requirement.

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Attachment 1

FCCU CO, NO_x and SO₂ CEM Exceedences

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ATTACHMENT 1

FCCU CO, NO_x and SO₂ CEM Exceedances

Background

The Lemont Refinery's FCCU began operating its Wet Gas Scrubber on October 21, 2007 and its Selective Catalytic Reduction (SCR) unit on December 7, 2007. The Lemont Refinery monitors its FCCU using Continuous Emission Monitoring System (CEMS) CO, NO_x, SO₂, and O₂ analyzers. New CEMs were installed as a part of the overall project; the new analyzers underwent a relative accuracy test audit (RATA) on April 17, 2008. The following CEMS Quality Assurance activities occurred:

- Quarterly Cylinder Gas Audits (CGAs) were performed on all of the FCCU CEMS systems during this reporting period;
- A RATA was performed on the FCCU CO/O₂ CEMS systems during this reporting period
- A RATA was performed on all of the FCCU CEMS systems in the 2nd half of 2011..

Non-maintenance related deviations of relevant standards are summarized below. These include evaluations against:

CO (12A-6961): hourly and daily rolling 365-day average standards (500 and 100 ppmv, respectively),
 NO_x (12A-6964): daily rolling 7-day and 365-day average standards (40 and 20 ppmv, respectively), and
 SO₂ (12A-6963): daily rolling 7-day and 365-day average standards (50 and 25 ppmv, respectively).

All are corrected to 0% O₂.

Duration of CO Exceedances

- a) The NSPS standard of 500ppmvd CO, corrected to 0% O₂, was exceeded on a 1-hr average as summarized below:

Source	Analyzer	Number of hours exceeding standard on 1-hr average basis		
		3 rd Quarter	4 th Quarter	Total
FCCU, 112C-1	12A-6961R	0	2	2

- b) The 1-hr rolling average CO NSPS standard was exceeded as shown below:

Start	Readings (ppmvc), by hour, during periods of excess hourly average
11/23/2012 13:00	514
11/23/2012 14:00	550
Total hours excess for Period	2
Total hours excess – 3 rd Quarter	0
Total hours excess – 4 th Quarter	2
Hours of Operation 3 rd Quarter	2,208.00
Hours of Operation 4 th Quarter	2,209.00

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Start	Readings (ppmvc), by hour, during periods of excess hourly average
Hours of Operation, Reporting Period	4,417.00
% Excess 3 rd Quarter	0.00%
% Excess 4 th Quarter	0.09%
% Excess for Reporting Period	0.05%

- c) The CO 365-day rolling average was exceeded:

Source	Analyzer	Number of days exceeding standard on rolling 365-day average basis		
		3rd Quarter	4th Quarter	Total
FCCU, 112C-1	12A-6961X	0	0	0

- d) The CO 365-day rolling average was exceeded as shown below:

Start	Readings (ppmvc), by day, during periods of excess daily rolling 365- day average
No exceedances	-
Total days excess for Period	0
Total days excess – 3 rd Quarter	0
Total days excess – 4 th Quarter	0
Days of Operation 3 rd Quarter	92
Days of Operation 4 th Quarter	92
Days of Operation, Reporting Period	184
% Excess 3 rd Quarter	0%
% Excess 4 th Quarter	0%
% Excess for Reporting Period	0%

- e) During the second half of 2012 112C-1 did not exceed the NSPS CO standard (500 ppmvd, corrected to 0% excess air, 1-hr average basis) by more than 5 % of the FCCU total operating time in either quarter. The 1-hr average CO exceedances were associated with a FCCU trip due to a loss of flow at the slurry generators when coke catchers were being switched.
- f) The FCCU CO CEMS downtime is summarized below:

Source	Analyzer	Number of hours of Downtime		
		3rd Quarter	4th Quarter	Total
112C-1	12A-6961R	1.5	86	87.5

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Duration of NO_x Exceedances

- a) The NSPS standard of 40 ppmvd NO_x, corrected to 0% O₂, was exceeded on a daily rolling 7-day average as summarized below:

Source	Analyzer	Number of days exceeding standard on rolling 7-day average basis		
		3 rd Quarter	4 th Quarter	Total
FCCU, 112C-1	12A-6964V	0	4	4

- b) The daily rolling 7-day average NO_x standard was exceeded as shown below:

Day	Readings (ppmvc), by day, during periods of excess daily rolling 7-day average
12/11/2012	41
12/12/2012	46
12/13/2012	50
12/14/2012	46
Total days excess for Period	4
Total days excess – 3 rd Quarter	0
Total days excess – 4 th Quarter	4
Days of Operation 3 rd Quarter	92
Days of Operation 4 th Quarter	92
Days of Operation, Reporting Period	184
% Excess 3 rd Quarter	0.00%
% Excess 4 th Quarter	4.35%
% Excess for Reporting Period	2.17%

- c) The daily rolling 365-day average NO_x standard was exceeded:

Source	Analyzer	Number of days exceeding standard on rolling 365-day average basis		
		3 rd Quarter	4 th Quarter	Total
FCCU, 112C-1	12A-6964X	0	0	0

The rolling 365-day average NO_x limit of 20 ppmv, db (corrected to 0% O₂) became effective on 12/31/2007. 365 days of operation vs. that limit was achieved on 12/30/2008. So that is when that limit became relevant.

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- d) The NO_x 365-day rolling average was exceeded as shown below:

Start	Readings (ppmvc), by day, during periods of excess daily rolling 365- day average
No exceedances	-
Total days excess for Period	0
Total days excess – 3 rd Quarter	0
Total days excess – 4 th Quarter	0
Days of Operation 3 rd Quarter	92
Days of Operation 4 th Quarter	92
Days of Operation, Reporting Period	184
% Excess 3 rd Quarter	0%
% Excess 4 th Quarter	0%
% Excess for Reporting Period	0%

The rolling 365-day average NO_x limit of 20 ppmv, db (corrected to 0% O₂) became effective on 12/31/2007. 365 days of operation vs. that limit was achieved on 12/30/2008. So that is when that limit became relevant.

- e) During the 2nd half of 2012 112C-1 exceeded the NO_x standard (40 ppmvd, corrected to 0% excess air, daily rolling 7-day average basis) by more than 5 % of the FCCU total operating time during the 4th quarter. This occurred when the unit, designed to operate in partial-burn mode, was operating in full-burn mode during CO Boiler maintenance. During this period, the regenerator excess O₂ was minimized to minimize NO_x emissions.
- f) The FCCU NO_x CEMS downtime is summarized below:

Source	Analyzer	Number of hours of Downtime		
		1st Quarter	2nd Quarter	Total
112C-1	12A-6964V	1.5	86	87.5

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Duration of SO₂ Exceedances

- a) The NSPS standard of 40 ppmvd SO₂, corrected to 0% O₂ was exceeded on a daily rolling 7-day average as summarized below:

Source	Analyzer	Number of days exceeding standard on rolling 7-day average basis		
		3 rd Quarter	4 th Quarter	Total
FCCU, 112C-1	12A-6963V	0	0	0

- b) The daily rolling 7-day average SO₂ standard was exceeded as shown below:

Start	Readings (ppmve), by day, during periods of excess daily rolling 7-day average
No exceedances	-
Total days excess for Period	
Total days excess – 3 rd Quarter	0
Total days excess – 4 th Quarter	0
Days of Operation 3 rd Quarter	92
Days of Operation 4 th Quarter	92
Days of Operation, Reporting Period	184
% Excess 3 rd Quarter	0%
% Excess 4 th Quarter	0%
% Excess for Reporting Period	0%

- c) The daily rolling 365-day average SO₂ standard (25 ppmv, db, corr to 0% O₂) was exceeded as indicated below:

Source	Analyzer	Number of days exceeding standard on 365-day rolling average basis		
		3 rd Quarter	4 th Quarter	Total
FCCU, 112C-1	12A-6963X	0	0	0

The rolling 365-day average SO₂ limit of 25 ppmv, db (corrected to 0% O₂) became effective on 12/31/2007. 365 days of operation vs. that limit was achieved on 12/30/2008. So that is when that limit became relevant.

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- d) The daily rolling 365-day average SO₂ standard (25 ppmv, db corr to 0% O₂) was exceeded as shown below:

Start	Readings (ppmvc), by day, during periods of excess daily rolling 365- day average
No exceedances	-
Total days excess for Period	
Total days excess – 3 rd Quarter	0
Total days excess – 4 th Quarter	0
Days of Operation 3 rd Quarter	92
Days of Operation 4 th Quarter	92
Days of Operation, Reporting Period	184
% Excess 3 rd Quarter	0%
% Excess 4 th Quarter	0%
% Excess for Reporting Period	0%

The rolling 365-day average SO₂ limit of 20 ppmv, db (corrected to 0% O₂) became effective on 12/31/2007. 365 days of operation vs. that limit was achieved on 12/30/2008, so that is when that limit became relevant.

- e) During the second half of 2012 112C-1 did not exceed the NSPS SO₂ standard (50 ppmvd, corrected to 0% excess air, 1-hr average basis) by more than 5 % of the FCCU total operating time in either quarter.
- f) The FCCU SO₂ CEMS downtime is summarized below:

Source	Analyzer	Number of hours of Downtime		
		3rd Quarter	4th Quarter	Total
112C-1	12A-6963V	1.5	86	87.5

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Attachment 2

Heaters and Boilers

Not applicable this reporting period.
Final NOx Control Plan update submitted February 2012.

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Attachment 3

Fuel Gas Combustion Devices, NSPS Exceedances

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ATTACHMENT 3

Fuel Gas Combustion Devices, NSPS Exceedances

Background

The Lemont Refinery monitors fuel gas to its fuel gas combustion devices using fuel gas H₂S analyzers on eight fuel gas loops. There were periods during the reporting period when various analyzers read above 0.1 gr H₂S/dscf fuel gas (equivalent to 161.5 ppmv) on a 3-hr rolling average basis (calculated hourly).

Duration of Exceedances

- a) The NSPS standard of 0.1 gr H₂S /dscf fuel gas (equivalent to 161.5 ppmv) was exceeded on a rolling 3-hr average as summarized below:

Source	Analyzer	Number of hours exceeding standard on 3-hr rolling average basis		
		3 rd Quarter	4 th Quarter	Total
South Plant fuel gas ^a	43A-1903	0	13	13
U114/116 fuel gas ^{b, c}	25A490BES	0	0	0
U115/125 fuel gas ^{c, d}	25A490AES	0	0	0
Coker 2 fuel gas ^{e, f}	09A-1904	0	5	5
Coker 2 PSA gas ^{f, g}	09A-1909	0	0	0
U118/122 fuel gas ^h	22A4920AES	0	9	9
U123 fuel gas ^{i, j}	23A-7000ES	0	2	2
North Plant boiler fuel gas ^{j, k}	43A-7010E	0	2	2

^a 102B-2, 103B-1, 111B-1A, 111B-1B, 111B-2, 112B-1, 112B-2, 113B-1, 113B-2, 113B-3, 119C-1A, 119C-1B, 121B-7C, 121B-7D, 430B-1, 590H-1, 590H-2.

^b 114B-1, 114B-2, 114B-3, 116B-1, 116B-2, 116B-3, 116B-4

^c U114/116 and U115/125 fuel gas loops share an analyzer (analyzer alternates between fuel gas loops).

^d 115B-1, 115B-2, 125B-1, 125B-2

^e 106B-1, 107B-21 (idle), 108B-41, 108B-42, 109B-62

^f Coker 2 fuel gas and Coker 2 PSA gas loops share an analyzer (analyzer alternates between fuel gas loops).

^g 109B-62

^h 118B-1, 118B-51, 122B-1, 122B-2

ⁱ 123B-1, 123B-2, 123B-3, 123B-4, 123B-5

^j U123 and North Plant Boiler fuel gas loops share an analyzer (analyzer alternates between fuel gas loops).

^k 431B-20

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b) The 3-hr rolling average NSPS standard was exceeded as shown below:

	Readings (ppmv), by analyzer by hour, during periods of excess rolling 3-hour averages							
	South Plant fuel gas	U114/ 116 fuel gas	U115/ 125 fuel gas	Coker 2 fuel gas	Coker 2 PSA gas	U118/ 122 fuel gas	U123 fuel gas	North Plant boiler fuel gas
3rd Quarter								
No Events	-	-	-	-	-	-	-	-
Total hours in 3 rd Quarter	0	0	0	0	0	0	0	0
4th Quarter								
12/2/2012 4:00	481							
12/2/2012 5:00	1,043					455		
12/2/2012 6:00	1,683			238		750		
12/2/2012 7:00	1,845			558		936		
12/2/2012 8:00	1,369			729		820		
12/2/2012 9:00	776			539		583	185	190
12/2/2012 10:00	206			227		294	182	194
12/21/2012 15:00	236							
12/21/2012 16:00	315							
12/21/2012 17:00	321							
12/22/2012 19:00	702					307		
12/22/2012 20:00	777					396		
12/22/2012 21:00	754					397		
Total hours of in 4 th Quarter	13	-	-	5	-	9	2	2
No. of hours for Semi-annual Period	13	0	0	5	0	9	2	2
Hours of Operation, 3 rd Quarter	2,208.00	1,933.95	2,208.00	2,208.00	2,208.00	2,208.00	2,208.00	2,208.00
Hours of Operation, 4 th Quarter	2,209.00	2,209.00	2,209.00	2,209.00	2,209.00	2,209.00	2,209.00	2,209.00
Total for Semi-annual Period	4,417.00	4,142.95	4,417.00	4,417.00	4,417.00	4,417.00	4,417.00	4,417.00
% Excess, 3 rd Quarter	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
% Excess, 4 th Quarter	0.59%	0.00%	0.00%	0.23%	0.00%	0.41%	0.09%	0.09%
% Excess, Semi-annual Period	0.29%	0.00%	0.00%	0.11%	0.00%	0.20%	0.05%	0.05%

c) During the second half of 2012, no fuel gas loop's H₂S exceeded the NSPS 3-hr rolling average standard as a percentage of the respective fuel gas loop's or boiler's total operating times by more than 5% in either quarter.

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d) The H₂S CMS downtime for the various fuel gas loops is summarized below:

Source	Analyzer	Number of hours of CMS downtime		
		3 rd Quarter	4 th Quarter	Total
South Plant fuel gas	43A-1903	0.00	0.00	0.00
U114/116 fuel gas	25A490BES	0.00	0.00	0.00
U115/125 fuel gas	25A490AES	0.00	0.00	0.00
Coker 2 fuel gas	09A-1904	14.25	0.00	14.25
Coker 2 PSA gas	09A-1909	14.25	0.00	14.25
U118/122 fuel gas	22A4920AES	0.25	0.00	0.25
U123 fuel gas	23A-7000ES	0.25	0.00	0.25
North Plant boiler fuel gas	43A-7010E	0.25	0.00	0.25

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Attachment 4

Sulfur Recovery Plant, NSPS Exceedences

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ATTACHMENT 4

Sulfur Recovery Plant, NSPS Exceedances

Background

The Lemont Refinery monitors its Tail Gas Recovery Systems on four Sulfur Plant Claus Trains, Trains “A,” “B,” “C” and “D,” using CEMS SO₂ analyzers. These SO₂ analyzers have recorded the following, non-maintenance related deviations (un-shaded areas below), where the CEMS SO₂ analyzer, corrected for 0% dry O₂, read above 250 ppm on a 12hr rolling average calculated on a 1 hour basis.

Duration of Exceedances

- a) The NSPS standard of 250ppm, corrected for 0% dry O₂, was exceeded on a rolling 12-hr average as summarized below:

Source	Analyzer	Number of hours exceeding standard on 12-hr rolling average basis (total/non-maintenance)		
		3 rd Quarter	4 th Quarter	Total
U119 A-Train	19A-998D	0	38/38	38/38
U119 B-Train	19A-1998D	0	0	0
U121 C-Train	21A-999D	0	22/22	22/22
U121 D-Train	21A-1999D	12/12	22/22	34/34

- b) The 12-hr rolling average NSPS standard was exceeded as shown below (shaded periods reflect planned startup/shutdown/maintenance):

Start	Readings (ppmv), by analyzer by hour, during periods of excess rolling 12-hr average, by analyzer			
	U119 A-Train	U119 B-Train	U121 C-Train	U121 D-Train
3rd Quarter				
	No excess	No excess	No excess	
9/4/2012 15:00				355
9/4/2012 16:00				385
9/4/2012 17:00				389
9/4/2012 18:00				391
9/4/2012 19:00				398
9/4/2012 20:00				407
9/4/2012 21:00				412
9/4/2012 22:00				416
9/4/2012 23:00				408
9/5/2012 0:00				396
9/5/2012 1:00				380
9/5/2012 2:00				302
Total Hrs for Period	0	0	0	12
4th Quarter				

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Start	Readings (ppmv), by analyzer by hour, during periods of excess rolling 12-hr average, by analyzer			
	U119 A-Train	U119 B-Train	U121 C-Train	U121 D-Train
		No Excess		
11/1/2012 17:00	269			
11/1/2012 18:00	434			
11/1/2012 19:00	437			
11/1/2012 20:00	440			
11/1/2012 21:00	442			
11/1/2012 22:00	443			
11/1/2012 23:00	443			
11/2/2012 0:00	444			
11/2/2012 1:00	444			
11/2/2012 2:00	445			
11/2/2012 3:00	447			
11/2/2012 4:00	447			
11/2/2012 5:00	280			
12/2/2012 5:00	335		279	
12/2/2012 6:00	424		319	265
12/2/2012 7:00	620		319	272
12/2/2012 8:00	789		319	274
12/2/2012 9:00	834		318	272
12/2/2012 10:00	845		319	269
12/2/2012 11:00	851		321	267
12/2/2012 12:00	851		321	273
12/2/2012 13:00	852		321	273
12/2/2012 14:00	859		321	283
12/2/2012 15:00	952		320	286
12/2/2012 16:00	965			
12/2/2012 17:00	778			
12/2/2012 18:00	843			
12/2/2012 19:00	694			
12/2/2012 20:00	549			
12/2/2012 21:00	537			
12/2/2012 22:00	572			
12/2/2012 23:00	628			
12/3/2012 0:00	712			
12/3/2012 1:00	832			
12/3/2012 2:00	989			257
12/3/2012 3:00	908		282	287
12/3/2012 4:00	1,088		288	299
12/3/2012 5:00	1,952		290	310
12/3/2012 6:00			292	314
12/3/2012 7:00			291	314
12/3/2012 8:00			291	315
12/3/2012 9:00			291	315
12/3/2012 10:00			291	313
12/3/2012 11:00			290	312

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Start	Readings (ppmv), by analyzer by hour, during periods of excess rolling 12-hr average, by analyzer			
	U119 A-Train	U119 B-Train	U121 C-Train	U121 D-Train
12/3/2012 12:00			288	310
12/3/2012 13:00			252	270
Total Hrs for Period	38	0	22	22
Total Excess Hrs 3 rd Quarter	0	0	0	12
Total Excess Hrs 4 th Quarter	38	0	22	22
Total Excess Hrs – this period	38	0	22	34
Hrs of Operation 3 rd Quarter	2,208.00	2,129.35	2,208.00	1,962.45
Hrs of Operation 4 th Quarter	2,188.98	2,209.00	2,209.00	2,209.00
Hrs of Operation – this period	4,396.98	4,338.35	4,417.00	4,171.45
% Excess 3 rd Quarter	0.00%	0.00%	0.00%	0.61%
% Excess 4 th Quarter	0.82%	0.00%	1.00%	1.00%
% Excess – this period	0.41%	0.00%	0.50%	0.82%

c) The 12-hour rolling average NSPS standard was exceeded:

- 1) 1 event, totaling 13 hours (A-Train CEMS SO₂ Analyzer 19A-998D)
- 2) 1 event, totaling 25 hours (A-Train CEMS SO₂ Analyzer 19A-998D)
- 3) 1 event, totaling 22 hours (C-train CEMS SO₂ Analyzer 21A-999D)
- 4) 1 event, totaling 12 hours (D-train CEMS SO₂ Analyzer 21A-1999D)
- 5) 1 event, totaling 22 hours (D-train CEMS SO₂ Analyzer 21A-1999D)

Of the above events, none were associated with planned train startups or shutdowns. The 2nd, 3rd, and 5th events (all occurring on 12/2-3/2012) were associated with unplanned train shutdowns. The trains shutdown per procedure and then were restarted per procedure.

d) None of the four trains (119A-train, 119B-train, 121C-train, and 121D-train) exceeded the standard by more than 5% of their respective individual total operating time during the period.

Duration of CEMS Downtime

e) The downtime for 119 A-Train and B-Train and 121 C-Train and D-Train SRU SO₂ analyzer systems is summarized below:

Source	Analyzer	Number of hours of Downtime		
		3 rd Quarter	4 th Quarter	Total
U119 A-Train	19A-999D	63.25	28.50	91.75
U119 B-Train	19A-1999D	28.00	57.50	85.50
U121 C-Train	21A-999D	27.25	30.00	57.25
U121 D-Train	21A-1999D	7.75	15.25	23.00

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Attachment 5

PMO Plan Revision Log

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ATTACHMENT 5

PMO Plan Revision Log

1/29/2013 Revision 16

Changes:

12.0 Optimization Studies / Incident Report Root Cause Analyses

Added the following Incident Report Root Cause Analyses

An off-ratio train event occurred December 2, 2012 (07:00) when amine circulation stopped due to an electrical problem, and an operator error caused both C and D trains to go off ratio, and A-train to trip during the C/D train re-start. Joe Noreiko was the lead investigator. Copies of the Investigation Report 121202 are provided upon request.

An acid gas flaring event at 844C-2 occurred December 2, 2012 (05:08) when an operator error tripped D train. Joe Noreiko was the lead investigator. Copies of the Investigation Report 121202 are provided upon request.

Appendix B Start-up and Shutdown Procedures

Title Changes in Appendix B:

119748	"A" Train Hot Restart After a Train Trip
119749	"B" Train Hot Restart After a Train Trip
121600	2012 TA"C" Train Shutdown w/o Burnoff and with 2643M Low/Low Combustion Air Flow Trip
121601	2012 TA"D" Train Shutdown w/o Burnoff and with 2643M Low/Low Combustion Air Flow Trip

Added Procedures to Appendix B:

119754	"A" Train Cold Restart
119755	"B" Train Cold Restart
121834	2012 T/A –Combustor Refractory Dry Out

Appendix C Lemont Refinery SRC Emergency Operating Procedures

Added Procedures to Appendix C:

119562	Loss of Natural Gas to Units 119 and 121
119882	Temporary Sulfur Legs to transfer Sulfur to Pit
121835	Temporary Sulfur Legs to Transfer Sulfur to Pit
121902	Bypass Nuclear Level Shutdowns for (21F-401C) Nuclear Source Replacement

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1/12/2012 Revision 15

Changes:

6.0 Mechanical Upgrades and Installations

Upgrades and Installations Already in Place

A and B Trains

- CEMS Isolation Valves

This project installed isolation valves on the CEMS analyzers. This project allows for safer maintenance of the CEMS analyzers. (2012)

Amine System

- Replace A Amine Regenerator Bottoms Coolers (2012)

This project replaced the A regenerator bottoms coolers with a better metallurgy exchanger. (2012)

11.0 Process Hazard Analysis Evaluations

- Hazop on A and B Trains, MEA Regenerators, Sour Water Strippers, A and B Trail Tail Gas Unit (2012)

13.0 PMO Plan Responsibilities

- Changed Contact Information:
Erin Null
Sulfur Operations Process Engineer
630-257-4939
enull@citgo.com

Procedure Title Changes in Appendix B

121600	2012 TA"C" Train Shutdown w/o Burnoff and with 2643M Low/Low Combustion Air Flow Trip
121601	2012 TA"D" Train Shutdown w/o Burnoff and with 2643M Low/Low Combustion Air Flow Trip

Added Procedures to Appendix B & C:

119300	Sulfur Loading from "A" and "B" Sulfur Pits into Tank Cars
119917	Bypass Nuclear Level Shutdowns on Amine and Sour Water K.O. Drums for X-Raying
121710	2012 T.A.-Nitrogen Purge and Commission the Fuel Gas System
121711	Nitrogen Purge and Pressure Test (21F-1D) Amine K.O. Drum
121717	2012 Turnaround "C" Train-BSRP Cold Startup
121718	2012 "D" Train-BSRP Cold Startup after Acid Gas/ Natural Gas Heat Soak and Shutdown
121814	2012 Sulfur Train Refractory Dryout
121830	Refractory Heatup
121833	2012 T/A-Deinventory Absorber, Absorber Water Wash, and Reinventory Absorber Towers

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1/12/2012 Revision 14

Changes:

6.0 Mechanical Upgrades and Installations

Upgrades and Installations Already in Place

General Sulfur Unit

- Implemented Safe Operating Limits for sulfur complex (2011)
- Revised “High H₂S in FG procedure” (2011)
- Implemented new procedure for all train shutdowns. (2011)
This procedure utilizes N₂ cooling and significantly reduces SO₂ emissions during train shutdowns.

C & D Trains

- DCS Logic to Prevent Emissions During Upset (2011)
In the event that a “big” Train (either C or D Train) trips out, this logic will help to keep the other trains running by using front end pressure control of C or D Train.

A and B Trains

- Rerange Natural Gas Flow Meter on 119 RGG (2011)

Amine System

- Discontinue use of antioxidant injection (2011)
- Upgrade ion exchange cycle timing and caustic/water reservoir level indication, install filter on instrument air to ion exchange skid, and install pressure transmitters to measure resin bed DP (2011)

Sour Water System

- Install antifoulant injection on D-5 Sour water stripper to prevent fouling from clay/silt (2012)

Planned Upgrades and Installations

- Planed repairs for 19TK-401
- H₂S monitor standardization of alarms, horn signals, strobes
- Replace A Train TGU valves
- Changing Low Combustion Air Flow SIS trips on C and D Train

Appendix B Start-up and Shutdown Procedures

Additions

- 119607 “A” Sulfur Train Shutdown with Natural Gas Heat Soak and Nitrogen Cooldown
- 119608 “B” Sulfur Train Shutdown with Natural Gas Heat Soak and Nitrogen Cooldown
- 121703 Presulfiding “C” and “D” Train
- 121705 “C” or “D” Train Pre Start-up Checklist
- 121706 C or D Sulfur Recovery Train Pre Startup Pressure Test
- 121707 “C” Train Walkthrough Checklist
- 121712 Nitrogen Purge and Pressure Test (21F-1C) Amine K.O. Drum

Deletions

- 119604 “A” Sulfur Train Shutdown with Natural Gas Burnout

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- 119605 "B" Sulfur Train Shutdown with Natural Gas Burnout
- 119719 Using a Portable Igniter for Lighting Sulfur Train Burners.
- 119721 119721 19F-3B MEA Precoat Filter Start-Up Procedure
- 121629 C Train Shutdown with 3MM Low Low Combustion Air Flow Trip
- 121630 D Sulfur Train Shutdown with 3 MM Low Low Combustion Air Trip
- 121715 "C" Train Start-up with Natural Gas/Burnout/Shutdown
- 121716 "D" Train Start-up with Natural Gas/Burnout/Shutdown
- 121721 C Train-BSRP Cold Start Procedure
- 121722 D Train-BSRP Cold Start Procedure

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7/15/2011 Revision 13

6.0 Changes

Upgrades and Installations Already in Place

C & D Trains

- 1) C/D-Train Nitrogen Purge Configuration
This project updated the purge timers for C&D trains.
- 2) C Train Steam Turbine knockout drum
This project covered the installation of a knockout drum to remove any water from the 220# steam caused during boiler upset conditions. This will prevent train trips due to wet steam.
- 3) Autoclave Direct Injection Pulsation Dampening
This project covered installation of a permanent system to reduce pressure hammer caused by steam condensation in the autoclave feed lines. This will provide for improved reliability of Stretford froth pumps, and pump discharge line rupture disks and check valves.
- 4) Unit 121 SO₂ Analyzers
This project covered installation of SO₂ analyzers on C and D tail gas to the absorbers. Monitoring SO₂ breakthrough will help to predict Stretford chemistry upsets.

Amine System

- 1) 19P-318 - Bring New Indication to DCS
The outlet pressure of the amine pumps is routed to the Sulfur Board. This pressure indication is trendable and will help operators to know when a pump is going bad or having trouble pumping.

Planned Upgrades and Installations

- 1) Replace B Amine Regenerator Bottoms Coolers
This project will replace the B regenerator bottoms coolers with a better metallurgy exchanger.
- 2) Sulfur Reliability Project 2012
 - 1) Improve Autoclave Overhead Quench Control
 - 2) Monitor Autoclave Packing Pressure Drop
 - 3) Improve Flow Control on C & D Train RGG for Presulfiding & Natural Gas Mode
 - 4) Improve Flow Control on C & D Train Main & Trim Air
 - 5) Improve C & D Sulfur Train Controls with Pneumatic Indication
 - 6) Install Level Indication for Sulfur Condensers
 - 7) Install Flow Indication on N₂ for A & B Train
 - 8) Install Nuclear Level Indication on C & D Train Stretford Absorbers
 - 9) Install Skimmer Pump Flow Indication
 - 10) Install A & B Train Hot Gas Bypass Valve Position Indication
- 3) Install constant caustic addition for Stretford
- 4) Upgrade E2T on all trains
- 5) Upgrade TK-50 knife gate valves
- 6) Rerange Natural Gas Flow Meter on 119 RGG

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Added Procedures to Appendix B & C:

119509	Emergency Shutdown With No Evacuation
119510	Response to a Low Sulfur Pit Sweep Flow
119716	Sulfur Recovery Train Pre Start-Up Checklist
119727	Start-up (19D-1A) MEA Regenerator
119749	Restart "B" Train to TGU after a Train Trip
121505	Low Combustor Temperature and/or Combustor Flameout
121510	Response to a Low Sulfur Pit Sweep Flow
121600	"C" Train Natural Gas Hot Shutdown With 3MM Low/Low Combustion Air Flow Trip
121601	"D" Train Natural Gas Hot Shutdown with 3MM Low/Low Air Flow Trip
121/605	121/605 Shutting Down Autoclave 21D-5C
121/701	121/701 "C" Train/BSRP Refractory Dry-Out Procedure
121715	"C" Train Start-up with Natural Gas/Burnout/Shutdown
121716	"D" Train Start-up with Natural Gas/Burnout/Shutdown

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1/25/11 Revision 12

Document-wide: Changed “MEA” to “Amine”.

1.0 Lemont Refinery Sulfur Recovery Complex Overview

Added to absorber list:

- ULSD Hydrotreater Purge Gas
- ULSD Hydrotreater Recycle Gas

2.0 Sulfur Shedding Procedure

Added to Load Shed Procedure Description:

“To help facilitate quick implementation of the load shedding procedure, an alarm system has been implemented on the Udex board. When a sulfur train goes down, the Udex board gets an alarm indicating to them that the load shed procedure should be implemented.”

6.0 Mechanical Upgrades and Installations

Added to C and D Train Section (Moved from Planned Upgrades and Installations Section):

- Medium Level Oxygen Enrichment
C and D Train Front End Burners for the combustion furnace were modified to accommodate medium level oxygen enrichment. Modifications added additional capacity to both C and D Train.
- Replace Stretford Isolation valves and Balance Tank
This project changed out the isolation valves between the oxidizer tanks and between the balance tank and the oxidizer tanks. Also the Balance tank was replaced.
- Board Monitoring of Stretford Air Flow
 - This project installed three transmitters to monitor the air flow to all three Stretford oxidizer tanks.
- Board Monitoring of Stretford Heater Flow
This installed a transmitter to monitor the Stretford flow to the Stretford heater. Ensuring that this flow is maintained will help maintain proper chemical concentration in the Stretford.
- C/ D Train Pit Vent Rerouting
This project moved the pit vent nozzles on the combustors to prevent sulfur solidification in the nozzle and combustor and to allow a more reliable sweep flow.
- D-Train Combustor Fuel Gas Regulator Hand Wheel
This project installed a hand wheel on the fuel gas regulator for D combustor. This allows D-Train to continue running while doing maintenance on this regulator.
- C/D Train Pressure Switch Low Shutdown
This project installed transmitters to replace the current level switches (19LS-339/1339). This allows for troubleshooting of this instrument and prevents train trips due to instrument failure.
- Permanent Stretford Purge

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This project installed a permanent 1.5 gpm Stretford purge to the waste water treatment plant. This purge helps control the accumulation of Thiosulfates in the Stretford and helps avoid Stretford chemistry upsets.

- **Create Tags to Signal Sulfur Train Down**
This project created an alarm on the Udex board. If the Udex board operator gets this alarm, he is to communicate with the sulfur board operator to see if load shedding is necessary.
- **C/D-Train Nitrogen Purge Configuration**
This project will update purge timers for C&D trains.

Added to Amine System Section (Moved from Planned Upgrades and Installations Section):

- **MEA Conversion to MDEA**
In July 2010 this project started to convert the refinery amine system from MEA to MDEA; a tertiary amine. The new amine will allow for increased concentration and higher rich solvent loadings, which can greatly reduce the system circulation, save energy, and unload the capacity-limiting lean amine cooling system. Along with the conversions a coalescer, carbon absorber, ionic exchange resin skid for heat stable salt removal and additional filtration capacity was added to the amine circulation system.
- **ULSD**
In July 2010 an Ultra Low Sulfur Diesel Hydrotreater unit was installed. This unit installed two additional amine absorbers to recover H₂S gas from the purge gas and recycle gas streams.

Added to Planned Upgrades and Installations Section:

- **Replace A Amine Regenerator Bottoms Coolers**
This project will replace the A regenerator bottoms coolers with a better metallurgy exchanger.
- **Autoclave Overhead Pressure Protection**
This project will install a relief system on the autoclaves. The autoclaves are currently not sufficiently protected from overpressure.
- **Install New Turbines or Buy Replacements for C and D Air Blower Turbines**
C and D Train air blower turbines are obsolete. This project will look into either buying a spare turbine or upgrading the turbines to a newer model. This will help in the lead time for parts in the case that the turbine goes down and needs maintenance.
- **A and B Train Waste Heat Boiler Reliability**
This project will make the level indication shutdown for the waste heat boilers more reliable.
- **Unit 121 SO₂ Analyzers**
This project will install SO₂ analyzers on C and D tail gas to the absorbers. Monitoring SO₂ breakthrough will help to predict Stretford chemistry upsets.
- **Unit 121 New H₂S Monitors near Snorkels**
This project will install new H₂S monitors near the snorkels of C and D Train air blowers, making it safer for operators in the case of backflow or plugging in C or D Train.
- **DCS Logic to Prevent Emissions During Upset**
In the event that a "big" Train (either C or D Train) trips out, this logic will help to

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keep the other trains running by using front end pressure control of C or D Train.

- CEMS Isolation Valves
This project will install isolation valves on the CEMS analyzers. Currently a line break is performed every time the CEMS analyzers are worked on. This project will allow for safer maintenance of the CEMS analyzers.
- 19P-318 - Bring New Indication to DCS
The outlet pressure of the amine pumps will be routed to the Sulfur Board. This pressure indication will be trendable and will help operators to know when a pump is going bad or having trouble pumping.

12.0 Optimization Studies / Incident Report Root Cause Analyses

Added "MDEA Loss event occurred on 10/26/10 where Outfall 001 was shutdown for a period of 8 days to avoid ammonia permit exceedance for plant effluent to Chicago Ship & Sanitary Canal. Larry Tyler was the lead investigator. Copies of the Investigation Report Incident 26033 are provided upon request."

13.0 PMO Plan Responsibilities

Changed contact information: Erica Havekost, Sulfur Operations Process Engineer, 630-296-2974, ehaveko@citgo.com

Appendix B Start-up and Shutdown Procedures

Added as new:

119707	(D-3) Sour Water Stripper Start-Up
119708	(D-4) Sour Water Stripper Start-Up
119709	(D-5) Sour Water Stripper Start-Up
119712	(D-6) Sour Water Stripper Start-Up
119713	Start-Up (19D-1B) MEA Regenerator
119714	(19D-401C) MEA Regenerator Start-Up
119715	(19D-401D) MEA Regenerator Start-Up
121635	"C" Sulfur Train Startup on Natural Gas and Burnout to Allow Shutdown
121636	"D" Sulfur Train Startup on Natural Gas and Burnout to Allow Shutdown
121727	"C" Sulfur Train Hot Start with 3 MM Low / Low Combustion Air Trip
121728	"D" Sulfur Train Hot Start-Up with 3 MM Low / Low Combustion Air Trip

Removed (Inactive Procedures):

119613	119613 - Regenerator Shutdown Procedure
119617	119617 19F-3A MEA Filter Shutdown Procedure
119623	119623 - B Train Shutdown Procedure
119717	"A" Sulfur Train Pre Start-Up Pressure Test After Major T/A
119720	119720 19F-3A MEA Filter Start-Up Procedure
119727	119727 - 19D-1A Regenerator Start-Up Procedure
121621	121621 - C Train BMS Initiated Shutdown
121622	121622 D Train BMS Initiated Shutdown
121631	121631 - C Train Normal Shutdown Procedure
121632	121632 - D Train Normal Shutdown Procedure

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121633	"C" Sulfur Train Hot Shutdown
121634	"D" Sulfur Train Hot Shutdown
121702	121/702 "D" Train/BSRP Refractory Dry-Out Procedure
121703	Presulfiding Procedure For "C" Train
121704	Presulfiding Procedure For "D" Train
121705	121705 - C or D Train Pre Start-Up Checklist
121706	C or D Sulfur Recovery Train Pre Startup Pressure Test
121723	"C" Train Hot Start-up
121724	121724 - D Train Hot Start Procedure
121725	"C" Sulfur Train Startup with 3 MMSCFD Low/Low Combustion Air Trip
121726	D" Sulfur Train Startup with the 3MM Low Low Air Trip
121730-A	121730 "C" Train Startup (Without Adequate Burnoff)
121730-B	121732 - "D" Train Startup Procedure (Without Adequate Burnoff)
121/701	121/701 "C" Train/BSRP Refractory Dry-Out Procedure
121-725	121-725 Introduction of Oxygen to C Train
121-726	121-726 Introduction of Oxygen to D Train

**Appendix C Lemont Refinery SRC Emergency Operating Procedures
Removed (Inactive Procedures):**

121515	121515 - D Sulfur Train Shutdown with C Sulfur Train in T/A
121-423	121-423 Prepare Oxygen lines for Maintenance

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07/28/2010 Revision 11

Section 2 – Sulfur Shedding Procedure

Original --

The following plan will be implemented in the event that planned/unplanned shutdowns, emergency shutdowns, or malfunctions result in excess SRU feed gas or a reduction in MEA processing capacity. These measures shall be taken as soon as possible to reduce emissions as quickly as practicable.

1. Use available SRU/MEA capacity
2. Stop LCO feed at the Diesel Hydrotreater (U25)
3. Reduce feed to Coker (U13)
4. Reduce Feed to North Plant Coker (U06)
5. Stop LCO feed from FCC (U12) to Diesel Hydrotreater (U25)
6. Stop LCO feed to FCC first, then Reduce LCGO (U12)
7. Reduce feed to ISAL
8. Reduce feed to Crude (U11)
9. Reduce LCGO feed to Diesel Hydrotreater (U25)

Operators and supervisors should maintain records of what actions were taken in accordance with this plan. This plan is encompassed in the following procedure and covers a range of events that require sulfur load shedding.

121500 - Refinery Sulfur Train Load Shedding Procedure

Revision --

A procedure is in place to handle sulfur load shedding. This plan is encompassed in the following procedure and covers a range of events that require sulfur load shedding.

121500 - Refinery Sulfur Train Load Shedding Procedure

The plan laid out in the above procedure will be implemented in the event that planned/unplanned shutdowns, emergency shutdowns, or malfunctions result in excess SRU feed gas or a reduction in MEA processing capacity. The procedure will be implemented by the Udex board, which is not otherwise involved in load shedding. These measures shall be taken as soon as possible to reduce emissions as quickly as practicable.

Operators and supervisors will maintain records of what actions were taken in accordance with this plan. The load shed procedure is available on the prism computer system and the most recent copy is posted at the Udex board. This procedure, which is updated periodically, will not be updated in this manual since the current sheets will be available on the computer network.

Section 6 – Mechanical Upgrades and Installations

Revision -- Added Planned Upgrades and Installations

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- 12) C/ D Train Pit Vent Rerouting
This project will moving the pit vent nozzles on the combustors to prevent sulfur solidification in the nozzle and combustor and to allow a more reliable sweep flow.
- 13) C/ D Absorber Level and Pressure Drop Indication
This project will install level and pressure drop indication on C and D Absorbers to avoid premature shutdowns and reduced rates due to pressure build up.
- 14) C/D Train Low Pressure Shutdown Switches
This project will improve the reliability of the train low pressure shutdown switches.
- 15) Stretford Winter Thiosulfate Removal
This project will make it possible to remove thiosulfates in the winter and help avoid the upsets that occur due to high thiosulfate circulation.

Section 12 – Optimization Studies/Incident Report Root Cause Analysis

Revision -- Added

C Train Absorber Plugging event occurred April 1, 2010 (14:24) when an sulfur build-up in the bottom trays of the Absorber caused back pressure and reduced capacity on the train the ultimate shutdown for cleaning and repair. Joe Noreiko was the lead investigator. Copies of the Investigation Report 040110 are provided upon request.

Revision--

Appendix B Start-up and Shutdown Procedures

Procedure #	Procedure Title	Modification to PMO Plan
119603	"B" Sulfur Train Acid Gas and Natural Gas Heat Soak and Shutdown for Uncoupled Trip Testing	New
119604	"A" Sulfur Train Shutdown with Natural Gas Burnout	Title Change
119605	"B" Sulfur Train Shutdown with Natural Gas Burnout	New
119606	119606 119F-50 Condensate Drum Shutdown Procedure	Removed
119615	MEA Regenerator Shutdown and Clearing Procedure	Title Change
119703	119703 - 119F-21C MEA Separator Start-Up and Operating Procedure	Removed
119704	119704 - 119F-50 Condensate Drum Start-Up Procedure	Removed
119706	119706 – Start-Up Procedure For MEA Reclaimer E-405	Removed
119707	(D-3) Sour Water Stripper Start-Up	Removed
119708	(D-4) Sour Water Stripper Start-Up	Removed
119709	(D-5) Sour Water Stripper Start-Up	Removed
119710	119710 – Restarting A or B Train after Tripping out	Removed
119711	119711 – A-Train Startup After Burn Off or Catalyst Change Out	Removed
119712	(D-6) Sour Water Stripper Start-Up	Removed
119713	119713 – 19D-1B MEA Regenerator Start-Up Procedure	Removed

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119714	119714 - 19D-401C MEA Regenerator Start-Up Procedure	Removed
119715	119715 - 19D-401D MEA Regenerator Start-Up Procedure	Removed
119716	119716 – Sulfur Recovery Train Pre Start-Up Checklist	Removed
119717	"A" Sulfur Train Pre Start-Up Pressure Test After Major T/A	Title Change
119718	119718 "B" Sulfur Recovery Train Pre Start-Up Pressure Test	Removed
119719	Using a Portable Ignitor for Lighting Sulfur Train Burners.	Title Change
119724-B	119/724 D-6 Sour Water Stripper Start-up	Removed
119725-A	119726 – "B" Train Startup Procedure Following a Complete Burnoff or Catalyst Change	Removed
119725-B	119/725 F401C Startup Procedure	Removed
11926	Place the Amine Carbon Adsorber System in Service	New
119730	"A" Sulfur Train Start-up after Uncouple Trip Test or Turnaround	Title Change
119731	"B" Sulfur Train Start-up after Uncouple Trip Test or Turnaround	Title Change
119732	A Sulfur Train Pre Startup Pressure Test After Catalyst Changeout	New
119733	"B" Sulfur Train Pre-Startup Pressure Test After Catalyst Changeout	New
121629	C Train Shutdown with 3MM Low Low Combustion Air Flow Trip	New
121630	D Sulfur Train Shutdown with 3 MM Low Low Combustion Air Trip	New
121700	"C" Train Shutdown and Start-up to Natural Gas Operation	New
121701	"D" Train Shutdown and Start-up to Natural Gas Operation	New
121703	Presulfiding Procedure For "C" Train	Title Change
121704	Presulfiding Procedure For "D" Train	Title Change
121706	C or D Sulfur Recovery Train Pre Startup Pressure Test	Title Change
121721	C Train-BSRP Cold Start Procedure	Title Change
121722	D Train-BSRP Cold Start Procedure	Title Change
121725	"C" Sulfur Train Startup with 3 MMSCFD Low/Low Combustion Air Trip	New
121726	D" Sulfur Train Startup with the 3MM Low Low Air Trip	New
119/618	119/618 19F-3B MEA Precoat Filter Shutdown Procedure	Removed
119/622	119/622 19G-403E/404C Lean MEA Pump Shutdown Procedure	Removed
121/605	121/605 Shutting Down Autoclave 21D-5C	Removed
121/606	121/606 Shutdown And Clearing Of Converter Beds	Removed

Appendix C Lemont Refinery SRC Emergency Operating Procedures

Procedure #	Procedure Title	
119508	Responding to an H2S Alarm in the MDEA System	New
121421	121510 Oxygen Shutdown at C Train	Removed
121422	121511 - Oxygen Shutdown at D Train	Removed

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02/02/2010 Revision 10

Section 1 – Lemont Refinery Sulfur Recovery Complex Overview

Original --

Two (19D-1A and 19D-1B) are designed to process 450 GPM of amine solution and the other two (19D-401C and 19D-401D) are designed to process 900 GPM of amine solution. Each ARU is independent with their own rich amine flash drum, lean and rich amine exchangers. The ARU's provide lean amine to and receive rich amine from the refinery amine header. There are a total of thirteen absorbers on the refinery amine header, each listed below. The North Plant Coker Recycle Gas and South Plant Coker Wet Gas Absorbers are not in service.

Revision --

Two (19D-1A and 19D-1B) are designed to process 450 GPM of amine solution and the other two (19D-401C and 19D-401D) are designed to process 900 GPM of amine solution. The feed for all four ARUs comes through an oil separator that flashes and scrubs light hydrocarbons and decants off heavier hydrocarbons. Each ARU is independent with their own rich amine flash drum, and lean/rich amine exchangers. The ARU's provide lean amine to and receive rich amine from the refinery amine header. There are a total of thirteen absorbers on the refinery amine header, each listed below. The South Plant Coker Wet Gas Absorber is not in service

Original --

The D-6 Tower typically process high-cyanide sour water.

Revision --

The D-6 Tower typically processes high-cyanide sour water.

Section 2 – Sulfur Shedding Procedure

Original --

1. Use available SRU/MEA capacity
2. Stop LCO feed at the Diesel Hydrotreater (U25)
3. Reduce feed to Coker (U13)
4. Reduce Feed to North Plant Coker (U08)
5. Stop LCO feed to FCC first, then Reduce LCGO (U12)
6. Reduce feed to ISAL
7. Reduce feed to Crude (U11)
8. Reduce Catalytic Reformer feed (U14)
9. Reduce LCGO feed to Diesel Hydrotreater (U25)

Revision --

1. Use available SRU/MEA capacity

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2. Stop LCO feed at the Diesel Hydrotreater (U25)
3. Reduce feed to Coker (U13)
4. Reduce Feed to North Plant Coker (U06)
5. Stop LCO feed from FCC (U12) to Diesel Hydrotreater (U25)
6. Stop LCO feed to FCC first, then Reduce LCGO (U12)
7. Reduce feed to ISAL
8. Reduce feed to Crude (U11)
9. Reduce LCGO feed to Diesel Hydrotreater (U25)

Section 6 – Mechanical Upgrades and Installations

Original --

MEA System

- 1) MEA/Oil Separator
Installed a new MEA/ oil separator in 2002 to reduce the likelihood of hydrocarbon from entering the SRU's. Hydrocarbon entering the SRU's can result in unit upsets or even pluming.
- 2) Metallurgy Upgrades:
Piping in high temperature MEA service (piping between the regenerator / reboiler and the regenerator / bottoms cooler) will be upgraded to stainless steel. This is to reduce corrosion.

Revision --

MEA System

- 1) MEA/Oil Separator
Installed a new MEA/ oil separator in 2002 to reduce the likelihood of hydrocarbon from entering the SRU's. Hydrocarbon entering the SRU's can result in unit upsets or even pluming.
- 2) Metallurgy Upgrades:
Piping in high temperature MEA service (piping between the regenerator / reboiler and the regenerator / bottoms cooler) was upgraded to stainless steel. This is to reduce corrosion.
- 3) MEA Bottoms Cooler Upgrade:
The headbox and inlet nozzle thicknesses on 19E-404C, C Regenerator Bottoms Cooler were increased and tube inserts were installed to help reduce corrosion. (2009)

Original --

Planned Upgrades and Installations

Along with the changes and upgrades in place, there are plans in place to perform several more changes and upgrades, which are planned to be implemented between 2009 and 2011.

- 1) MEA Conversion to MDEA
This project will convert the refinery amine system into a system that instead will use a tertiary amine. The new amine will allow for increased concentration and higher rich solvent loadings, which can greatly reduce the system circulation, save energy,

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- and unload the capacity-limiting lean amine cooling system.
- 2) Medium Level Oxygen Enrichment
C and D Train Front End Burners for the combustion furnace will be modified to accommodate medium level oxygen enrichment. Modifications will add additional capacity to both C and D Train.
 - 3) Autoclave Improvements
This project will cover installing controtrace on the overhead piping of C & D Autoclaves.
 - 4) Replace Stretford Isolation valves and Balance Tank
This project will cover changing out the isolation valves between the oxidizer tanks and between the balance tank and the oxidizer tanks. This will allow the tanks to be worked on without slowing down the refinery. Also the Balance tank needs to be replaced.
 - 5) pH meter reliability
This project will cover upgrading the current pH meters on the C & D contact condensers.
 - 6) D-Train Nitrogen Purge Configuration
This project will update purge timers for C&D trains.
 - 7) D-Train Combustor Fuel Gas Regulator Hand Wheel
This project will cover installing a hand wheel on the fuel gas regulator for D combustor. This will allow D-Train to continue running while doing maintenance on this regulator.

Revision --

Planned Upgrades and Installations

Along with the changes and upgrades in place, there are plans in place to perform several more changes and upgrades, which are planned to be implemented between 2010 and 2011.

- 1) MEA Conversion to MDEA
This project will convert the refinery amine system into a system that instead will use a tertiary amine. The new amine will allow for increased concentration and higher rich solvent loadings, which can greatly reduce the system circulation, save energy, and unload the capacity-limiting lean amine cooling system.
- 2) Medium Level Oxygen Enrichment
C and D Train Front End Burners for the combustion furnace will be modified to accommodate medium level oxygen enrichment. Modifications will add additional capacity to both C and D Train.
- 3) Autoclave Improvements
This project will cover installing controtrace on the overhead piping of C & D Autoclaves.
- 4) Replace Stretford Isolation valves and Balance Tank
This project will cover changing out the isolation valves between the oxidizer tanks and between the balance tank and the oxidizer tanks. This will allow the tanks to be worked on without slowing down the refinery. Also the Balance tank needs to be replaced.
- 5) D-Train Nitrogen Purge Configuration

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This project will update purge timers for C&D trains.

6) D-Train Combustor Fuel Gas Regulator Hand Wheel

This project will cover installing a hand wheel on the fuel gas regulator for D combustor. This will allow D-Train to continue running while doing maintenance on this regulator.

7) Board Monitoring of Stretford Air Flow

This project will cover installing three transmitters to monitor the air flow to all three Stretford oxidizer tanks.

8) Board Monitoring of Stretford Heater Flow

This project will cover installing a transmitter to monitor the Stretford flow to the Stretford heater. Ensuring that this flow is maintained will help maintain proper chemical concentration in the Stretford.

9) C Train Steam Turbine knockout drum

This project will cover installing a knockout drum to remove any water from the 220# steam caused during boiler upset conditions. This will prevent train trips due to wet steam.

10) C/D Train Pressure Switch Low Shutdown

This project will cover installing transmitters to replace the current level switches (19LS-339/1339). This will allow troubleshooting of this instrument and prevent train trips due to instrument failure.

11) Autoclave Direct Steam Injection Pulsation Dampening

This project will cover installing a permanent system to reduce pressure hammer caused by steam condensation in the autoclave feed lines. This will provide for improved reliability of Stretford froth pumps, and pump discharge line rupture disks and check valves.

Section 9 – Critical Operating Variables

Original --

Condition	Method of Monitoring	Actions
High Reading on Fuel Gas H2S Analyzer	<ul style="list-style-type: none"> DCS Display High alarm on Fuel Gas H2S at 159 ppm 	<ul style="list-style-type: none"> Troubleshoot Process Verify Proper MEA regeneration Verify Correct MEA Fuel Gas Absorber Rates Verify Max Lean MEA Cooling Notify Shift/Unit Supervisor for additional moves
High Reading on Train SO2 Analyzers	<ul style="list-style-type: none"> DCS Display High alarm on CEMS SO2 at 250 ppm for a 1 hour average 	<ul style="list-style-type: none"> Troubleshoot Process Alert Analyzer Group and have them verify accuracy of meters

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		<ul style="list-style-type: none"> • Route MEA Gas to other Trains if possible • Notify Shift/Unit Supervisor
Flaring of Sour Water or MEA Acid Gas	<ul style="list-style-type: none"> • DCS Display • Flow Meter on Sour Water Gas Vent and MEA Acid Gas Vent • Deviation and High pressure alarm on MEA Acid Gas • Deviation alarm on Sour Water Gas 	<ul style="list-style-type: none"> • Troubleshoot Process • Notify Shift/Unit Supervisor • Cut H2S Production per Sulfur Shedding Procedure if necessary
Tail Gas Oxidizer Stack Temperature Falls Below 875°F	<ul style="list-style-type: none"> • DCS Display • Temperature on Tail Gas Oxidizer Stack • Low alarm on Tail Gas Oxidizer Stack Temperature 	<ul style="list-style-type: none"> • Troubleshoot Process • Route MEA Gas to other Trains if possible • Notify Shift/Unit Supervisor

Revision --

Condition	Method of Monitoring	Actions
High Reading on Fuel Gas H2S Analyzer	<ul style="list-style-type: none"> • DCS Display • High alarm on Fuel Gas H2S at 159 ppm 	<ul style="list-style-type: none"> • Troubleshoot Process • Verify Proper MEA regeneration • Verify Correct MEA Fuel Gas Absorber Rates • Verify Max Lean MEA Cooling • Verify Min Lean MEA flow to 19F-21C scrubbing section • Notify Shift/Unit Supervisor for additional moves
High Reading on Train SO2 Analyzers	<ul style="list-style-type: none"> • DCS Display • High alarm on CEMS SO2 at 250 ppm for a 1 hour average 	<ul style="list-style-type: none"> • Troubleshoot Process • Alert Analyzer Group and have them verify accuracy of meters • Route MEA Gas to other Trains if possible • Notify Shift/Unit Supervisor

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Flaring of Sour Water or MEA Acid Gas	<ul style="list-style-type: none"> • DCS Display • Flow Meter on Sour Water Gas Vent and MEA Acid Gas Vent • High pressure alarm on MEA Acid Gas 	<ul style="list-style-type: none"> • Troubleshoot Process • Notify Shift/Unit Supervisor • Cut H2S Production per Sulfur Shedding Procedure if necessary
Tail Gas Oxidizer Stack Temperature Falls Below 875°F	<ul style="list-style-type: none"> • DCS Display • Temperature on Tail Gas Oxidizer Stack • Low alarm on Tail Gas Oxidizer Stack Temperature 	<ul style="list-style-type: none"> • Troubleshoot Process • Route MEA Gas to other Trains if possible • Notify Shift/Unit Supervisor

Section 11 – Process Hazard Analysis Evaluations

Original --

Hazop MDEA Project (2009)
 Hazop Revalidation on A and B Trains, MEA Regenerators, Sour Water Strippers (2007)
 Hazop A&B Train Tail Gas Unit Project (2007)
 Hazop Revalidation on C and D Trains (2004)
 Tier II Project Hazop (2000)

Revision --

Hazop Revalidation C and D Trains, and Beavon Tail Gas Unit (2009)
 Hazop MDEA Project (2009)
 Hazop Revalidation on A and B Trains, MEA Regenerators, Sour Water Strippers (2007)
 Hazop A&B Train Tail Gas Unit Project (2007)
 Hazop Revalidation on C and D Trains (2004)
 Tier II Project Hazop (2000)

Section 12 – Optimization Studies/Incident Report Root Cause Analysis

Original --

Below are the official incident report root cause analyses completed since 2004 on each system related to the Sulfur Recovery Complexes:

An acid gas flaring event at 844C-2 occurred November 21, 2008 (21:52) when an operator error tripped D train. Andy Kobler was the lead investigator. Copies of the Investigation Report 112108 are provided upon request.

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Revision --

Below are the official incident report root cause analyses completed since 2004 on each system related to the Sulfur Recovery Complexes:

A off-ratio train event occurred August 11, 200 (3:00) when an operator error caused both C and D trains to go off ratio. Matt Cordina was the lead investigator. Copies of the Investigation Report 081009 are provided upon request.

An acid gas flaring event at 844C-2 occurred November 21, 2008 (21:52) when an operator error tripped D train. Andy Kobler was the lead investigator. Copies of the Investigation Report 112108 are provided upon request.

Revision -

Appendix B Start-up and Shutdown Procedures

Procedure #	Procedure Title	Modification to PMO Plan
119602	A Sulfur Train Acid Gas and Natural Gas Heat Soak and Shutdown for Turbine Uncoupled Trip Testing	New Procedure
119604	B Sulfur Train Hot Shutdown and Restart to Natural Gas Heat Soak	New Procedure
119614	119614 – A Train Shutdown Procedure	Procedure Removed
119616	(D-3, D-4, D-5) Sour Water Stripper Shutdown	Procedure Title updated
119631	(D-6) SW Stripper Shutdown	Procedure Title updated
119707	(D-3) Sour Water Stripper Start-Up	Procedure Title updated
119708	(D-4) Sour Water Stripper Start-Up	Procedure Title updated
119709	(D-5) Sour Water Stripper Start-Up	Procedure Title updated
119712	(D-6) Sour Water Stripper Start-Up	Procedure Title updated
119724-B	119/724 D-6 Sour Water Stripper Start-up	New Procedure
119725-B	119/725 F401C Startup Procedure	New Procedure
119729	119729 - Regenerator Startup	Procedure Removed
119730	"A" Sulfur Train Start-up after Shutdown	New Procedure
119731	"B" Sulfur Train Start-up after Shutdown	New Procedure
121633	"C" Sulfur Train Hot Shutdown	Procedure Title updated
121634	"D" Sulfur Train Hot Shutdown	Procedure Title updated
121702	121/702 "D" Train/BSRP Refractory Dry-Out Procedure	New Procedure
121723	"C" Train Hot Start-up	Procedure Title updated
121/702	121/702 "D" Train/BSRP Refractory Dry-Out Procedure	Procedure Removed

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Appendix C Lemont Refinery SRC Emergency Operating Procedures

Procedure #	Procedure Title	
119501	"A" or "B" Train Oxidizer Flameout or Low Oxidizer Temp	Procedure Title updated
121421	121510 Oxygen Shutdown at C Train	New Procedure
121422	121511 - Oxygen Shutdown at D Train	New Procedure
121500	Refinery Sulfur Train Load Shedding	Procedure Title updated
121501	121501 - Loss Of Stretford Circulation	Procedure Title updated
121507	Reaction to C or D Train Trip	Procedure Title updated

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Section 1 – Lemont Refinery Sulfur Recovery Complex Overview

Original --

Two of the trains (A and B) have SRU/Thermal Oxidizer setup

Revision --

Two of the trains (A and B) have SRU/Beavon/Thermal Oxidizer setup

Original --

Each Beavon Tail Gas Unit is equipped with a vanadium/autoclave reclamation system.

Revision --

A and B Train's Beavon Tail Gas Unit is equipped with a Flexsorb amine reclamation system. C and D Train's Beavon Tail Gas Units are equipped with a vanadium/autoclave reclamation system

Original --

Each ARU train is independent with their own rich amine flash drum, lean and rich amine exchangers.

Revision --

Each ARU is independent with their own rich amine flash drum, lean and rich amine exchangers

Original --

There are a total of thirteen absorbers on the refinery amine header, each listed below:

Revision --

There are a total of thirteen absorbers on the refinery amine header, each listed below. The North Plant Coker Recycle Gas and South Plant Coker Wet Gas Absorbers are not in service.

Original --

5. Hydrotreater Recycle Gas

Revision --

5. North Plant Coker Recycle Gas

Original --

12. Coker Wet Gas

Revision --

12. South Plant Coker Wet Gas

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Section 2 – Sulfur Shedding Procedure

Original --

10. Use available SRU/MEA capacity
11. Stop LCO feed at the Diesel Hydrotreater (U25)
12. Reduce FCC feed (U12)
13. Reduce feed to Coker (U13)
14. Reduce Feed to North Plant Coker (U08)
15. Reduce Catalytic Reformer feed (U14)
16. Reduce Feed to Diesel Hydrotreater (U25)
17. Reduce Sour Water Stripper Feed, hold inventory in tankage (U19, U43)
18. Reduce crude oil feed rate (U11)

Revision --

1. Use available SRU/MEA capacity
2. Stop LCO feed at the Diesel Hydrotreater (U25)
3. Reduce feed to Coker (U13)
4. Reduce Feed to North Plant Coker (U08)
5. Stop LCO feed to FCC first, then Reduce LCGO (U12)
6. Reduce feed to ISAL
7. Reduce feed to Crude (U11)
8. Reduce Catalytic Reformer feed (U14)
9. Reduce LCGO feed to Diesel Hydrotreater (U25)

Original --

Operators and supervisors should maintain records of what actions were taken in accordance with this plan. This plan is encompassed in the following procedures depending on the cause of the sulfur shed.

- 119503 - Reaction to A-Train and/or B-Train Shutdown
- 119506 - Emergency Shutdown of C/D MEA Regenerators
- 119507 - MEA Regenerator Emergency Shutdown Guidelines
- 121500 - Refinery Sulfur Train Load Shedding Procedure
- 121507 - Reaction to C and/or D Train Trip

Revision --

Operators and supervisors should maintain records of what actions were taken in accordance with this plan. This plan is encompassed in the following procedure and covers a range of events that require sulfur load shedding.

- 121500 - Refinery Sulfur Train Load Shedding Procedure

Section 6 – Mechanical Upgrades and Installations

Upgrades and Installations Already in Place

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Revision -- Added

General Sulfur Unit:

- 1) Checking Ground Faults (2009)
The procedure for checking for ground faults was updated as well as better labels for the breakers to prevent unplanned equipment shutdowns.
- 2) Load Shedding Procedure (2009)
The procedure for load shedding was updated to maximize effectiveness by changing the load shedding sequence, have a board operator on an unaffected unit implement load shedding and give all involved board operators annual training.

C and D Trains:

Revision -- Removed

- 5) Metallurgy Upgrades:
Piping in high temperature MEA service (piping between the regenerator / reboiler and the regenerator / bottoms cooler) will be upgraded to stainless steel. This is to reduce corrosion. A portion of this has been completed.

Revision -- Added

- 5) Autoclave Level Control (2009)
The level control for the autoclaves was updated to provide more reliable operation.

A and B Trains:

Original --

- 4) Sulfur Reliability:
This project seals the Sulfur Pits to ensure ejector is working properly and sulfur vapor is being recovered.

Revision --

- 4) Sealing Sulfur Pits
This project seals the Sulfur Pits to ensure ejector is working properly and sulfur vapor is being recovered.

Revision -- Removed

- 5) D-Train nitrogen purge configuration:
Nitrogen purge configuration will be changed to improve reliability.

Revision -- Added

- 5) Tail gas recovery for A and B
This project installed a tail gas system for A and B trains, including a Beavon reactor and amine reclamation system.

MEA System:

Revision -- Added

- 2) Metallurgy Upgrades:

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Piping in high temperature MEA service (piping between the regenerator / reboiler and the regenerator / bottoms cooler) will be upgraded to stainless steel. This is to reduce corrosion.

Planned Upgrades and Installations

- Revision -- Removed
- 1) Metallurgy upgrades
Piping in high temperature MEA service (piping between the regenerator / reboiler and the regenerator / bottoms cooler) will be upgraded to stainless steel. This is to reduce corrosion. A portion of this has been completed.
- Revision -- Removed
- 2) Tail gas recovery for A and B
Currently A and B Train do not have Tail Gas Recovery, it is sent directly to an incinerator. The project to install a tail gas system for A and B trains is currently in the design stage, and will be installed by December 2008.
- Original --
- 5) Autoclave Improvements
This project will cover installing contratrace on the overhead piping of C & D Autoclaves and fixing the level transmitters.
- Revision --
- 3) Autoclave Improvements
This project will cover installing controtrace on the overhead piping of C & D Autoclaves.
- Revision -- Added
- 6) D-Train Nitrogen Purge Configuration
This project will update purge timers for C&D trains.

Section 9 – Critical Operating Variables

Original --

Condition	Method of Monitoring	Actions
High Reading on Fuel Gas H2S Analyzer	<ul style="list-style-type: none"> DCS Display High alarm on Fuel Gas H2S at 141 ppm High High alarm on Fuel Gas H2S at 159 ppm 	<ul style="list-style-type: none"> Troubleshoot Process Verify Proper MEA regeneration Verify Correct MEA Fuel Gas Absorber Rates Verify Max Lean MEA

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		<ul style="list-style-type: none"> Cooling Notify Shift/Unit Supervisor for additional moves
High Reading on C or D Train SO2 Analyzers	<ul style="list-style-type: none"> DCS Display High alarm on CEMS SO2 at 250 ppm for a 1 hour average 	<ul style="list-style-type: none"> Troubleshoot Process Alert Analyzer Group and have them verify accuracy of meters Route MEA Gas to other Trains if possible Notify Shift/Unit Supervisor
Pluming From Tail Gas Incinerator	<ul style="list-style-type: none"> Visual Observation High alarm on CEMS DCS Stack Temperature Rise High alarm on Stack Temp at 1250 F High High alarm on Stack Temp at 1350 F 	<ul style="list-style-type: none"> Troubleshoot Process Check Sulfur Leg for Potential plugging Route MEA Gas to other Trains if possible Notify Shift/Unit Supervisor
Flaring of Sour Water or MEA Acid Gas	<ul style="list-style-type: none"> DCS Display Flow Meter on Sour Water Gas Vent and MEA Acid Gas Vent Deviation and High pressure alarm on MEA Acid Gas Deviation alarm on Sour Water Gas 	<ul style="list-style-type: none"> Troubleshoot Process Notify Shift/Unit Supervisor Cut H2S Production per Sulfur Shedding Procedure if necessary
Tail Gas Oxidizer Stack Temperature Falls Below 875°F	<ul style="list-style-type: none"> DCS Display Temperature on Tail Gas Oxidizer Stack Low alarm on Tail Gas Oxidizer Stack Temperature Low low alarm on Tail Gas Oxidizer Stack Temperature 	<ul style="list-style-type: none"> Troubleshoot Process Route MEA Gas to other Trains if possible Notify Shift/Unit Supervisor
A or B Train Oxidizer Stack Temperature Falls Below 875°F	<ul style="list-style-type: none"> DCS Display Temperature on A and B Oxidizer Stacks Low alarm on A and B Oxidizer Stack Temperatures Low low alarm on A and B Oxidizer Stack Temperatures 	<ul style="list-style-type: none"> Troubleshoot Process Route MEA Gas to other Trains if possible Notify Shift/Unit Supervisor

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Revision --

Condition	Method of Monitoring	Actions
High Reading on Fuel Gas H2S Analyzer	<ul style="list-style-type: none"> • DCS Display • High alarm on Fuel Gas H2S at 159 ppm 	<ul style="list-style-type: none"> • Troubleshoot Process • Verify Proper MEA regeneration • Verify Correct MEA Fuel Gas Absorber Rates • Verify Max Lean MEA Cooling • Notify Shift/Unit Supervisor for additional moves
High Reading on Train SO2 Analyzers	<ul style="list-style-type: none"> • DCS Display • High alarm on CEMS SO2 at 250 ppm for a 1 hour average 	<ul style="list-style-type: none"> • Troubleshoot Process • Alert Analyzer Group and have them verify accuracy of meters • Route MEA Gas to other Trains if possible • Notify Shift/Unit Supervisor
Flaring of Sour Water or MEA Acid Gas	<ul style="list-style-type: none"> • DCS Display • Flow Meter on Sour Water Gas Vent and MEA Acid Gas Vent • Deviation and High pressure alarm on MEA Acid Gas • Deviation alarm on Sour Water Gas 	<ul style="list-style-type: none"> • Troubleshoot Process • Notify Shift/Unit Supervisor • Cut H2S Production per Sulfur Shedding Procedure if necessary
Tail Gas Oxidizer Stack Temperature Falls Below 875°F	<ul style="list-style-type: none"> • DCS Display • Temperature on Tail Gas Oxidizer Stack • Low alarm on Tail Gas Oxidizer Stack Temperature 	<ul style="list-style-type: none"> • Troubleshoot Process • Route MEA Gas to other Trains if possible • Notify Shift/Unit Supervisor

Note: Pluming was removed because now that there is a tail gas unit on A&B it is extremely unlikely.

Section 10 – Notification Procedure

Original --

- 1) Event: C or D Train SO2 analyzers show a reading above 250ppm on a 12 hour

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rolling average corrected to 0% excess air.

Revision --

- 1) Event: Train SO₂ analyzers show a reading above 250ppm on a 12 hour rolling average corrected to 0% excess air.

Revision -- Removed

- 3) Event: Pluming from tail gas incinerator is seen for at least 8 min.
Action: Operator immediately notifies Shift Area Supervisor.
Supervisor immediately notifies local agencies about possible exceedance.
Operator calls in a 3333.
Operator documents the event with a Malfunction/Breakdown Report.
Supervisor notifies Environmental Department.

Revision -- Removed

- 6) Event: A or B Train Oxidizer Stack Temperature fall below 875 °F.
Action: Operator immediately notifies Shift Area Supervisor.
Operator calls in a 3333.
Operator documents the event with a Malfunction/Breakdown Report.
Supervisor notifies Environmental Department.

Section 11 – Process Hazard Analysis Evaluations

Original --

Hazop A&B Train Tail Gas Unit Project
Hazop Revalidation on C and D Trains (2004)
Hazop Revalidation on A and B Trains, MEA Regenerators, Sour Water Strippers (2003)
Tier II Project Hazop (2000)

Revision --

Hazop MDEA Project (2009)
Hazop A&B Train Tail Gas Unit Project
Hazop Revalidation on C and D Trains (2004)
Hazop Revalidation on A and B Trains, MEA Regenerators, Sour Water Strippers (2007)
Tier II Project Hazop (2000)

Section 12 – Optimization Studies / Incident Report Root Cause Analyses

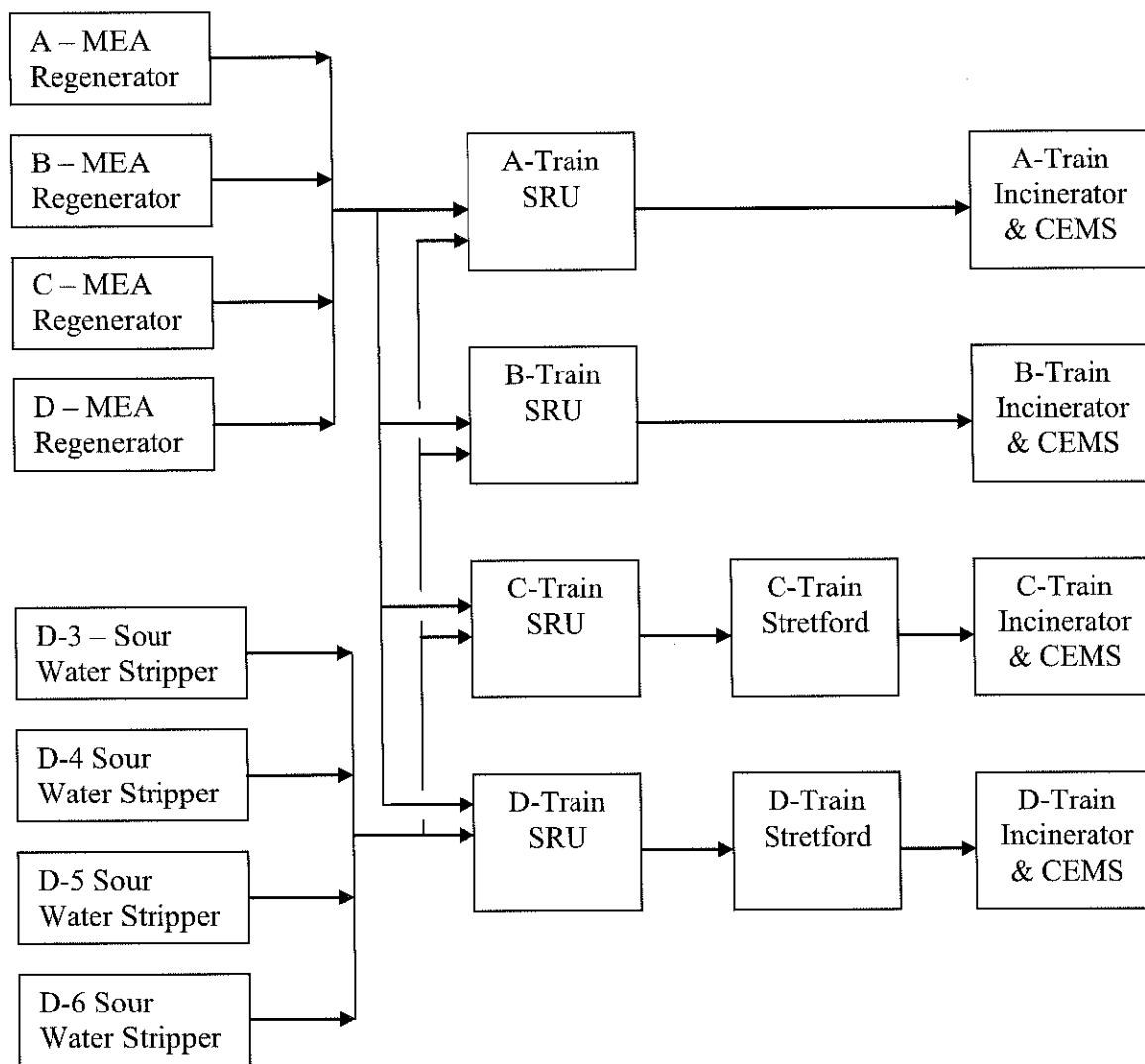
Revision -- Added

An acid gas flaring event at 844C-2 occurred February 4, 2007 (12:46 – 14:00) when C & D train tripped. Rod Sweer was the lead investigator. Copies of the Investigation Report 070204 are provided upon request.

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Appendix A – Lemont Refinery Sulfur Recovery Complex Simplified Operating Flow Scheme

Original --



Revision -

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Appendix B Start-up and Shutdown Procedures

Procedure #	Procedure Title	Modification to PMO Plan
119725-A	119726 – "B" Train Startup Procedure Following a Complete Burnoff or Catalyst Change	Procedure Number & Title updated
119748	119748 - Restarting A Train to TGU after a Train Trip	New Procedure
119750	119750 - TGU Fill, Circulate and Establish Flow	New Procedure
121730-A	121730 "C" Train Startup (Without Adequate Burnoff)	Procedure Number Update
121730-B	121732 - "D" Train Startup Procedure (Without Adequate Burnoff)	Procedure Number Update

Appendix C Lemont Refinery SRC Emergency Operating Procedures

Procedure #	Procedure Title	Modification to PMO Plan
119500	119500 - Responding to a H2S Alarm	Procedure Title Update
119551	119551 - TGU Loss of Booster Blower	New Procedure
121501	121501 - Loss of Stretford Circulation	Procedure Title Update
121509 -B	121509 - Emergency Shutdown With No Evacuation	Procedure Number Update
121510	121510 Oxygen Shutdown at C Train	Deleted
121511	121511 - Oxygen Shutdown at D Train	Deleted
121512	121512 - Responding to a Sulfur Pit Fire	Procedure Title Update

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Section 5 – Ultrasonic thickness monitoring

Original --

The hard copy results of the thickness readings are filed with the Inspection Department and are retained for the life of the equipment location.

Revision --

The hard copy results of the thickness readings are filed with the Inspection Department and are retained for the life of the equipment.

Section 6 – Mechanical Upgrades and Installations

Upgrades and Installations Already in Place

C and D Trains:

Revision -- Added

- 5) Metallurgy Upgrades:
Piping in high temperature MEA service (piping between the regenerator / reboiler and the regenerator / bottoms cooler) will be upgraded to stainless steel. This is to reduce corrosion. A portion of this has been completed.

A and B Trains:

Revision -- Added

- 5) D-Train nitrogen purge configuration:
Nitrogen purge configuration will be changed to improve reliability.

Planned Upgrades and Installations

Original --

Along with the changes and upgrades in place, there are plans in place to perform several more changes and upgrades, which are planned to be implemented between 2005 and 2009.

Revision --

Along with the changes and upgrades in place, there are plans in place to perform several more changes and upgrades, which are planned to be implemented between 2009 and 2011.

Original --

- 2) Metallurgy upgrades
Piping in high temperature MEA service (piping between the regenerator / reboiler and the regenerator / bottoms cooler) will be upgraded to stainless steel. This is to reduce corrosion. A

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portion of this has been completed.

Revision --

2) Metallurgy upgrades

Piping in high temperature MEA service (piping between the regenerator / reboiler and the regenerator / bottoms cooler) will be upgraded to stainless steel. This is to reduce corrosion. A portion of this has been completed.

Revision -- Added

5) Autoclave Improvements

This project will cover installing contratrace on the overhead piping of C & D Autoclaves and fixing the level transmitters.

6) Replace Stretford Isolation valves and Balance Tank

This project will cover changing out the isolation valves between the oxidizer tanks and between the balance tank and the oxidizer tanks. This will allow the tanks to be worked on without slowing down the refinery. Also the Balance tank needs to be replaced.

7) pH meter reliability

This project will cover upgrading the current pH meters on the C & D contact condensers.

8) D-Train Combustor Fuel Gas Regulator Hand Wheel

This project will cover installing a hand wheel on the fuel gas regulator for D combustor. This will allow D-Train to continue running while doing maintenance on this regulator.

Section 9 – Critical Operating Variables

Original --

Tail Gas Oxidizer Stack Temperature Falls Below 874°F

Revision --

Tail Gas Oxidizer Stack Temperature Falls Below 875°F

Original --

A or B Train Oxidizer Stack Temperature Falls Below 1050 for the daily average on a 24 hour basis

Revision --

A or B Train Oxidizer Stack Temperature Falls Below 875 °F

Section 10 – Notification Procedure

Original --

5) Event:

Tail Gas Oxidizer Stack Temperature Falls Below 874°F

Action:

Operator immediately notifies Shift Area Supervisor.

Operator calls in a 3333.

Operator documents the event with a Malfunction/Breakdown Report.

Supervisor notifies Environmental Department.

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Revision --

5) Event: Tail Gas Oxidizer Stack Temperature Falls Below 875°F
Action: Operator immediately notifies Shift Area Supervisor.
Operator calls in a 3333.
Operator documents the event with a Malfunction/Breakdown Report.
Supervisor notifies Environmental Department.

Original --

6) Event: A or B Train Oxidizer Stack Temperature fall below 1050 for the daily average on a 24 rolling hour basis.
Action: Operator immediately notifies Shift Area Supervisor.
Operator calls in a 3333.
Operator documents the event with a Malfunction/Breakdown Report.
Supervisor notifies Environmental Department.

Revision --

6) Event: A or B Train Oxidizer Stack Temperature fall below 875 °F.
Action: Operator immediately notifies Shift Area Supervisor.
Operator calls in a 3333.
Operator documents the event with a Malfunction/Breakdown Report.
Supervisor notifies Environmental Department.

Section 12 – Optimization Studies / Incident Report Root Cause Analyses

Revision -- Added

An acid gas flaring event at 844C-2 occurred November 21, 2008 (21:52) when an operator error tripped D train. Andy Kobler was the lead investigator. Copies of the Investigation Report 112108 are provided upon request.

Section 13 – PMO Plan Responsibilities

Original --

Beverly Pate
Operations Process Engineer
(630) 257 - 4939
bpate@citgo.com

Revision --

Beverly Rah
Operations Process Engineer
(630) 257 - 4939
bpate@citgo.com

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Procedure #	Procedure Title	Modification to PMO Plan
119601	119601 - Shutdown of D-6 Sour water Stripper Due to Loss of Pumpharound Fans	Updated Title
119719	119719 Using Ignitors for Lighting Sulfur Train Burners	Updated Title
119724-B	119/724 D-6 Sour Water Stripper Start-up	Procedure number updated to new system
119725-B	119/725 – F401C Startup Procedure	Procedure number updated to new system

Appendix C Lemont Refinery SRC Emergency Operating Procedures

Procedure #	Procedure Title	Modification to PMO Plan
119506-A	119506 - Emergency Shutdown With No Evacuation	Procedure number updated to new system
119506-B	119506 - Emergency Shutdown of C/D MEA Regenerators	Procedure number updated to new system

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Section 1 – Lemont Refinery Sulfur Recovery Complex Overview

Original --

There are a total of twelve absorbers on the refinery amine header, each listed below:

Revision --

There are a total of thirteen absorbers on the refinery amine header, each listed below:

Added --

13. North Plant Flare

Section 6 – Mechanical Upgrades and Installations

Under C and D Train Sulfur Reliability Added --

- Sealing Sulfur Pits to ensure ejector is working properly and sulfur vapor is being recovered.
- Changed the nitrogen purge on C-Train to improve train reliability.

Under A and B Train Added --

4) Sulfur Reliability

Sealing Sulfur Pits to ensure ejector is working properly and sulfur vapor is being recovered.

Under Planned Upgrades and Installations Added --

5) D-Train nitrogen purge configuration

Nitrogen purge configuration will be changed to improve reliability.

Section 9 – Critical Operating Variables

Added --

Flaring of Sour Water or MEA Acid Gas	<ul style="list-style-type: none">• DCS Display• Flow Meter on Sour Water Gas Vent and MEA Acid Gas Vent• Deviation and High pressure alarm on MEA Acid Gas• Deviation alarm on Sour Water Gas	<ul style="list-style-type: none">• Troubleshoot Process• Notify Shift/Unit Supervisor• Cut H2S Production per Sulfur Shedding Procedure if necessary
Tail Gas Oxidizer Stack Temperature Falls Below	<ul style="list-style-type: none">• DCS Display• Temperature on Tail	<ul style="list-style-type: none">• Troubleshoot Process• Route MEA Gas to

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874°F	<ul style="list-style-type: none"> Gas Oxidizer Stack • Low alarm on Tail Gas Oxidizer Stack Temperature • Low low alarm on Tail Gas Oxidizer Stack Temperature 	<ul style="list-style-type: none"> other Trains if possible • Notify Shift/Unit Supervisor
-------	--	--

Section 12 – Process Hazard Analysis Evaluations

Added --

An acid gas flaring event at 844C-2 occurred March 8, 2008 (03:30) when D train tripped. Joe Noreiko was the lead investigator. Copies of the Investigation Report 080308 are provided upon request.

Section 13 – PMO Plan Responsibilities

Original --

Paul M Case
Operations Process Engineer
(630) 257 - 4359
pcase@citgo.com

Revision –

Beverly Pate
Operations Process Engineer
(630) 257 - 4939
bpate@citgo.com

Appendix B & C –

Procedure #	Procedure Title	Modification to PMO Plan
119606	119606 119F-50 Condensate Drum Shutdown Procedure	Added missing procedure
119617	119617 19F-3A MEA Filter Shutdown Procedure	Added missing procedure
119728	119728 - Nitrogen Purge D-3 Stripper prior to Startup	Added missing procedure
119729	119729 - Regenerator Startup	Added missing procedure
119724	119724 D-6 Sour Water Stripper Start-up	Added missing procedure
121/606	121/606 Shutdown And Clearing Of Converter Beds	Added missing procedure
121/701	121/701 "C" Train/BSRP Refractory Dry-Out Procedure	Added missing procedure
121/702	121/702 "D" Train/BSRP Refractory Dry-Out Procedure	Added missing procedure
121500	121500 - REFINERY SULFUR TRAIN LOAD SHEDDING PROCEDURE	Added missing procedure

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Procedure #	Procedure Title	Modification to PMO Plan
121509	121509 - Emergency Shutdown With No Evacuation	Added missing procedure
121513	121513 - BMS PANEL C SULFUR TRAIN HOT START	Added missing procedure
121514	121514 - BMS PANEL D SULFUR TRAIN HOT START	Added missing procedure
121515	121515 - D Sulfur Train Shutdown with C Sulfur Train in T/A	Added missing procedure
121/602	121/602 31TK-479 Sulfide Spend Caustic Tank Neutralization Procedure	Deleted Procedure - no longer in data base
121508	121508 - Reaction to C and D Train Trip	Deleted Procedure - no longer in data base
119/725	119725 – F401C Startup Procedure	Edited Title

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Section 6 – Mechanical Upgrades and Installations

Original

C and D Trains

4) Sulfur Pit Vent Gas Recovery

...H₂S from D-Train

Revision

4) ...H₂S from C and D-Train

Original

A and b Trains

3) Sulfur Pit Vent Gas Recovery

...H₂S from A-Train

Revision

4) ...H₂S from A and B-Train

Original

Planned Upgrades and Installations

2) Sulfur Pit Vent Gas Recovery

Revision

Removed – Item completed

Original

Planned Upgrades and Installations

2) Sulfur Pit Vent Gas Recovery

Revision

Removed – Item completed, realigned numbering

Original

Planned Upgrades and Installations

Now 1-3

Revision

4) Medium Level Oxygen Enrichment

C and D Train Front End Burners for the combustion furnace will be modified to accommodate medium level oxygen enrichment. Modifications will add additional capacity to both C and D Train.

Section 10 – Notification Procedure

Original

No number 6

Revision

6) Event: A or B Train Oxidizer Stack Temperature fall below 1050 for the daily average on a 24 rolling hour basis.

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Action: Operator immediately notifies Shift Area Supervisor
Operator calls in a 3333.
Operator documents the event with a Malfunction/Breakdown Report.
Shift supervisor notifies Environmental Department

Section 12 – Optimization Studies/Incident Report Root Cause Analyses

Original

All recommendations either have been or are to be implemented at next Turnaround.

Revision

All recommendations have been implemented

Original

No 2007-12-06

Revision

An Acid gas flaring event at 844C-2 occurred December 6 (3:11-3:52) when both C- and D- Trains tripped. Andy Kobler was the lead investigator. Copies of the Incident Investigation Report 071206 provided upon request.

Section 13 – PMO Plan Responsibilities

Original

... updated on an annual basis

Revision

... updated on a semi-annual basis

Appendix B – Start-up and Shutdown Procedures

Revisions

Procedures removed

119605 - 119F-401C Sour Water Separator Shutdown Procedure
119700 119E-21 - BFW Cooler Start-Up Procedure
119701 119F-14 Condensate Drum Start-Up Procedure
119702 119F-15 Slop Oil Collector Start-Up Procedure
119705 F-18 Fuel Gas Knockout Start-Up Procedure
121706 - C or D Sulfur Recovery Train Pre Startup Pressure Test
119/600 119E-21 BFW Cooler Shutdown Procedure
119/602 119F-14 Condensate Drum Shutdown Procedure
119/603 119F-15 Slop Oil Collector Shutdown Procedure
119/604 119F-20 Sour Water Collection Drum Shutdown Procedure
119/606 119F-50 Condensate Drum Shutdown Procedure
119/609 F-7 And 4 Tank Shutdown Procedure
119/610 F-18 Fuel Gas Knockout Shutdown Procedure
119/612 Procedure For Clearing Overhead Condensers
119/617 19F-3A MEA Filter Shutdown Procedure
119/619 Procedure To Slump D-4 Stripper
119/624 SW Gas Header Shutdown/Clear Procedure

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119/627 MEA Gas Header Shutdown/Clear Procedure
121/600 Clearing Procedure For TK478
121/603 31TK-483- Fresh Caustic Tank Neutralization Procedure

Procedures Added

119613 Regenerator Shutdown Procedure
121633 C Sulfur Train Hot Shutdown Procedure
121634 C Sulfur Train Hot Shutdown Procedure

Appendix C – Lemont Refinery SRC Emergency Operating Procedures

Revision

Procedures Removed

121505 Low Combustor Temperature And/Or Combustor Flameout
121509 - Emergency Shutdown With No Evacuation

Procedures Added

119504 Response to Sulfur Pit Fire
121512 Response to Sulfur Pit Fire

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07/25/2007 Revision 5

Section 2 – Sulfur Shedding Procedures

Original --

Operators and supervisors should maintain records of what actions were taken in accordance with this plan. This plan is encompassed in the following procedures depending on the cause of the sulfur shed.

- 119503 - Reaction to A-Train and/or B-Train Shutdown
- 119506 - Emergency Shutdown of C/D MEA Regenerators
- 119507 - MEA Regenerator Emergency Shutdown Guidelines
- 121507 - Reaction to C or D Train Trip
- 121508 - Reaction to C and D Train Trip

Revision --

Operators and supervisors should maintain records of what actions were taken in accordance with this plan. This plan is encompassed in the following procedures depending on the cause of the sulfur shed.

- 119503 - Reaction to A-Train and/or B-Train Shutdown
 - 119506 - Emergency Shutdown of C/D MEA Regenerators
 - 119507 - MEA Regenerator Emergency Shutdown Guidelines
 - 121500 - Refinery Sulfur Train Load Shedding Procedure
 - 121507 - Reaction to C and/or D Train Trip
- Combined 121507 and 121508 – Renamed 121507 Reaction to C and/or D Train Trip and deleted 121508
 - Added 121500 – Refinery Sulfur Train Load Shedding Procedure

Section 6 – Mechanical Upgrades and Installations

Original --

4) MEA Conversion

This project will convert the refinery amine system into a system that instead will use a tertiary amine. The new amine will allow for increased concentration and higher rich solvent loadings, which can greatly reduce the system circulation, save energy, and unload the capacity-limiting lean amine cooling system.

Revision --

4) MEA Conversion to MDEA

This project will convert the refinery amine system into a system that instead will use a tertiary amine. The new amine will allow for increased concentration and higher rich solvent loadings, which can greatly reduce the system circulation, save energy, and unload the capacity-limiting lean amine cooling system. Combined

- to MDEA

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Section 10 – Notification Procedure

- Added 5) Event: Tail Gas Oxidizer Stack Temperature Falls Below 874°F
 Action: Operator immediately notifies Shift Area Supervisor.
 Operator calls in a 3333.
 Operator documents the event with a
 Malfunction/Breakdown Report.
 Supervisor notifies Environmental Department.

Section 11 – Process Hazard Analysis Evaluations

- Added – Hazop A&B Train Tail Gas Unit Project

Section 13 – PMO Plan Responsibilities

Original --

Chris M Cordina
Operations Process Engineer
(630) 257 - 4194
ccordin@citgo.com

Revision –

Paul M Case
Operations Process Engineer
(630) 257 - 4359
pcase@citgo.com

Appendix B –

Procedure #	Procedure Title	Modification to PMO Plan
119/606	119/606 119F-50 Condensate Drum Shutdown Procedure	Procedure Renumbered 119606 and Procedure Renamed 119606...
121500	121500 Refinery Sulfur Train Load Shedding Procedure	Created New Procedure
121507	121507 Reaction to C and/or D Train Trip	Removed Procedure 121508, combined 121508 and 121507, renamed 121507 to Reaction to C and/or D Train Trip
121508	121508 Reaction to C and D Train Trip	Removed Procedure 121508, combined 121508 and 121507, renamed 121507 to Reaction to C and/or D Train Trip

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1/24/2007 **Revision 4**

Section 6 – Mechanical Upgrades and Installations

C and D Trains - Sulfur Reliability:

Original --

A Sulfur Reliability Team was formed primarily to improve reliability associated with the C and D Trains BMS Shutdown and Startup Systems.

- Replace BMS limit switch valves with more reliable style,
- Install more reliable style chopper valves on C-Train and D-Train's nitrogen purge, natural gas and oxygen chopper valves (2005/2006)
- Replace C-Train and D-Train Waste Heat Boiler Level Switch with a level transmitter used for shutdown (2005/2006)
- Replaced C and D-Train Waste Heat Boiler level transmitter with more reliable design.
- Revised BMS startup graphic with more user friendly format.

Revision --

A Sulfur Reliability Team was formed primarily to improve reliability associated with the C and D Trains BMS Shutdown and Startup Systems.

- Replace BMS limit switch valves with more reliable style,
- Install more reliable style chopper valves on C-Train and D-Train's nitrogen purge, natural gas and oxygen chopper valves (2005/2006)
- Replace C-Train and D-Train Waste Heat Boiler Level Switch with a level transmitter used for shutdown (2005/2006)
- Replaced C and D-Train Waste Heat Boiler level transmitter with more reliable design.
- Revised BMS startup graphic with more user friendly format.
- Upgraded all piping and valves on C and D-Train contact condensers to correct metallurgy (from carbon steel to 304 stainless steel).

Added –

4) Sulfur Pit Vent Gas Recovery:

This project routes the trace amounts of H₂S from D-Train sulfur pit to the incinerator for conversion to SO₂.

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Section 13 – PMO Plan Responsibilities

Original --

Chris M Cordina
Operations Process Engineer
(630) 257 - 4194
ccordin@citgo.com

Revision –

Dustin Welch
Operations Process Engineer
(630) 257 - 4177
dwelch@citgo.com

Appendix B –

Procedure #	Procedure Title	Modification to PMO Plan
119601	119601 - Temporary shutdown of D-6 Sour water Stripper	Revised & Title Changed
119614	119614 - A Train Shutdown Procedure	Revised & Title Changed
119623	119623 - B Train Shutdown Procedure	Revised & Title Changed
119501	119501 - A or B Train Oxidizer Flameout or Low Oxidizer Temp	Revised & Title Changed
121504	121504 Relighting The Combustor During Loss of Stretford Circulation	Revised & Title Changed

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Planned Upgrades and Installations

Original –

2) Sulfur Pit Vent Gas Recovery

This project will route the trace amounts of H₂S that are in the sulfur pit to the incinerator for conversion to SO₂.

Revision –

2) Sulfur Pit Vent Gas Recovery

This project will route the trace amounts of H₂S that are in each sulfur pit to the incinerator for conversion to SO₂. A-Train and D-Train pit vents are currently installed.

Added –

4) MEA Conversion

This project will convert the refinery amine system into a system that instead will use a tertiary amine. The new amine will allow for increased concentration and higher rich solvent loadings, which can greatly reduce the system circulation, save energy, and unload the capacity-limiting lean amine cooling system.

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8/4/2006 Revision 3

Section 1 – Lemont Refinery Sulfur Recovery Complex Overview

Original –

Two (401 and 402) are designed to process 450 GPM of amine solution and the other two (403 and 404) are designed to process 900 GPM of amine solution.”

Revision –

Two (19D-1A and 19D-1B) are designed to process 450 GPM of amine solution and the other two (19D-401C and 19D-401D) are designed to process 900 GPM of amine solution.”

Original –

6. Needle Coker Fuel Gas

Revision –

6. North Plant Coker Fuel Gas

Section 6 – Upgrades and Installations Already in Place

C and D Trains – 3) Sulfur Reliability:

Original --

- Install more reliable style chopper valves on C-Train Nitrogen purge (2005)
- Replace C-Train Waste Heat Boiler Level Switch with a level transmitter used for shutdown (2005)

Revision --

- Install more reliable style chopper valves on C-Train and D-Train's nitrogen purge, natural gas and oxygen chopper valves (2005/2006)
- Replace C-Train and D-Train Waste Heat Boiler Level Switch with a level transmitter used for shutdown (2005/2006)

A and B Trains –

Original --

- 1) Remote Igniters on A-Train Front End Burner

Revision --

- 1) Remote Igniters on A-Train Front End and Aux Burner

Added –

- 3) Sulfur Pit Vent Gas Recovery
This project routes the trace amounts of H₂S from A-Train sulfur pit to the incinerator for conversion to SO₂.

Appendix B –

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Procedure #	Procedure Title	Modification to PMO Plan
119601	119601 - D-6 Shutdown for Instrument Transfer to Delta V	New Procedure
119711	119711 - A-Train Startup After Burn Off or Catalyst Change Out	Revised and Title Changed
119727	119727 - 19D-1A Regenerator Start-Up Procedure	New Procedure - Similar to 119113
121706	121706 - C or D Sulfur Recovery Train Pre Startup Pressure Test	New Procedure- Similar to 119117 and 119118
121709	121709 Lighting The Tail Gas Combustor	Revised and Title Changed (does not have a "/" in title)
121/700	121/700 Commissioning & Start-Up Unit 121 Sulfur And BSRP Complex Refractory Curing Procedure	Deleted - Actions are now covered in 121721 and 121722
121/606	121/606 Shutdown And Clearing Of Converter Beds	Expired - Actions are now covered in 121631 and 121632
121/701	121/701 "C" Train/BSRP Refractory Dry-Out Procedure	Expired - Actions are now covered in 121814
121/702	121/702 "D" Train/BSRP Refractory Dry-Out Procedure	Expired - Actions are now covered in 121814
121-722	121/722 "D" Train/BSRP Cold Start Procedure	Expired - Actions are now covered in 121722

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12/21/2005 Revision 2

Section 12 –

*Section 12 “PMO Plan Responsibilities” was changed to Section 13.
Section 12 “Optimization Studies / Incident Report Root Cause Analyses” was added,
which is shown below:*

12.0 Optimization Studies / Incident Report Root Cause Analyses

Below are the latest optimizations studies completed since 2004 on each system related to the Sulfur Recovery Complexes:

A and B Train Optimization Study (2004)

- This study conducted by Brimstone Engineering to provide recommendations for the Interim Performance Standard. Nine recommendations were made. All recommendations have either been implemented or are to be implemented at next Turnaround. The list of actions and recommendations are available upon request.

Below are the official incident report completed since 2004 on each system related to the Sulfur Recovery Complexes:

No official incident report root cause analyses have been performed or were required.

Section 6 – Upgrades and Installations Already in Place

C and D Trains:

3) Sulfur Reliability:

A Sulfur Reliability Team was formed, primarily to improve reliability associated with the C and D Trains BMS Shutdown and Startup. The following actions have so far been implemented:

- Replace all BMS limit switch valves with more reliable style (2005)
- Install more reliable style chopper valves on C-Train Nitrogen purge (2005)
- Replace C-Train Waste Heat Boiler Level Switch with a level transmitter used for shutdown (2005)
- Replace C and D-Train Waste Heat Boiler level transmitter with more reliable design (2005)
- Revise BMS startup graphic with more user friendly format (2005)

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Appendix B –

Procedure	Procedure Title	Modification to PMO Plan
119700	119700 119E-21 - BFW Cooler Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119701	119701 119F-14 Condensate Drum Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119702	119702 119F-15 Slop Oil Collector Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119703	119703 119F-21C MEA Separator Start-Up and Operating Procedure	Revised and Title Changed (does not have a "/" in title)
119704	119704 119F-50 Condensate Drum Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119705	119705 F-18 Fuel Gas Knockout Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119708	119708 - D-4 Sour Water Stripper Start-Up	Revised to be D-4 Specific
119709	119709 - D-5 Sour Water Stripper Start-Up	Revised and Title Changed (does not have a "/" in title)
119711	119711 - "A" Train Startup After Burn Off	Was 119/724.
119712	119712 - D-6 Sour Water Stripper Start-up	Was 119/724.
119714	119714 19D-401C MEA Rengenerator Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119715	119715 19D-401D MEA Regenerator Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119717	119717 "A" Sulfur Recovery Train Pre Start-Up Pressure Test	Revised and Title Changed (does not have a "/" in title)
119718	119718 "B" Sulfur Recovery Train Pre Start-Up Pressure Test	Revised and Title Changed (does not have a "/" in title)
119719	119719 Lighting Sulfur Train Burners Using The Ignitor Guns	Revised and Title Changed (does not have a "/" in title)
119720	119720 19F-3A MEA Filter Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119721	119721 19F-3B MEA Precoat Filter Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119722	119722 19GB-1A/B Combustion Air Blower Cold Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119723	119723 19G-403E/404C Lean MEA Pump Cold Start-Up Procedure	Revised and Title Changed (does not have a "/" in title)
119/631	B-Train AAG / Natural Gas Heat Soak and Shutdown with N2 Purge	Deleted - This is an obsolete procedure. Use 119623
119/724	119/724 D-6 Sour Water Stripper Start-up	Renumbered as 119712
119/724	119/724 "A" TRAIN STARTUP AFTER BURNOFF	Renumbered as 119711
119/724	119/724 - D-6 Sour Water Stripper Start-up Procedure	Deleted - Actions are now covered in 119712
121721	121721 - C Train-BSRP Cold Start Procedure	Revised and Title Changed (does not have a "/" in title)
121722	121722 - D Train-BSRP Cold Start Procedure	Revised and Title Changed (does not have a "/" in title)
121/731	121/731 "C" Train Normal Cold Startup Procedure	Deleted - Actions are now covered in 121631

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7/21/2005 **Revision 1**

Section 2 –

Sulfur shedding procedures were further developed to handle more situations.

Original: 119404 Emergency Shutdown of C/D MEA Regenerator
121/216 Reaction to C or D Train Trip

Revised: 119503 - Reaction to A-Train and/or B-Train Shutdown
119506 - Emergency Shutdown of C/D MEA Regenerators
119507 - MEA Regenerator Emergency Shutdown Guidelines
121507 - Reaction to C or D Train Trip
121508 - Reaction to C and D Train Trip

Appendix B –

Procedure	Procedure Title	Modification to PMO Plan
119605	119605 - 119F-401C Sour Water Separator Shutdown Procedure	Revised and Title changed (does not have a "/" in title)
119614	119614 - A Train Heat Soak & Burn-Off Guidelines	Revised and Title changed (does not have a "/" in title)
119615	119615 - MEA Regenerator Shutdown Procedure	Revised and Title changed (does not have a "/" in title)
119616	119616 D-3, D-4, D-5 Sour Water Stripper Shutdown Procedure	Revised and Title changed (does not have a "/" in title)
119621	119621 - 19GB-1A/B Combustion Air Blower Shutdown Procedure	Revised and Title changed (does not have a "/" in title)
119623	119623 - B Train Heat Soak & Burn-Off Guidelines	Revised and Title changed (does not have a "/" in title)
119/631	B-Train AAG / Natural Gas Heat Soak and Shutdown with N2 Purge	Revised and Title changed (does not have a "/" in title)
119631	D-6 SW Stripper Shutdown Procedure	Revised and Title changed (does not have a "/" in title)
119/711	119/711 "B" Train Start-Up Procedure	Deleted - Was combined with 119710
119706	119706 - Start-Up Procedure For MEA Reclaimer E-405	Revised and Title changed (does not have a "/" in title)
119707	119707 - D-3 Sour Water Stripper Start-Up	Revised and Title changed (does not have a "/" in title)
119710	119710 - Restarting A or B Train after Tripping out	Revised and Title changed (does not have a "/" in title)
119713	119713 - 19D-1B MEA Regenerator Start-Up Procedure	Revised and Title changed (does not have a "/" in title)
119716	119716 - Sulfur Recovery Train Pre Start-Up Checklist	Revised and Title changed (does not have a "/" in title)
119725	119725 - F401C Startup Procedure	Revised and Title changed (does not have a "/" in title)
119726	119726 - "B" Train Startup Procedure (Following a Complete Burnoff)	Revised and Title changed (does not have a "/" in title)
121/600	121/600 Clearing Procedure For TK478	Was not included in previous PMO Plan
121/602	121/602 31TK-479 Sulfide Spend Caustic Tank Neutralization Procedure	Was not included in previous PMO Plan
121/603	121/603 31TK-483- Fresh Caustic Tank Neutralization Procedure	Was not included in previous PMO Plan
121/605	121/605 Shutting Down Autoclave 21D-5C	Was not included in previous PMO Plan
121/606	121/606 Shutdown And Clearing Of Converter Beds	Was not included in previous PMO Plan
121621	121621 - C Train BMS Initiated Shutdown	Was not included in previous PMO Plan
121622	121622 D Train BMS Initiated Shutdown	Was not included in previous PMO Plan
121631	121631 - C Train Normal Shutdown Procedure	Was not included in previous PMO Plan
121632	121632 - D Train Normal Shutdown Procedure	Was not included in previous PMO Plan
121703	121703 - Presulfiding Procedure For "C" Train	Revised and Title changed (does not have a "/" in title)
121704	121704 - Presulfiding Procedure For "D" Train	Revised and Title changed (does not have a "/" in title)

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121705	121705 - C or D Train Pre Start-Up Checklist	Revised and Title changed (does not have a "/" in title)
121723	121723 - C Train Hot-Start Procedure	Revised and Title changed (does not have a "/" in title)
121724	121724 - D Train Hot Start Procedure	Revised and Title changed (does not have a "/" in title)
121730	121730 "C" Train Startup (Without Adequate Burnoff)	Revised and Title changed (does not have a "/" in title)
121732	121732 - "D" Train Startup Procedure (Without Adequate Burnoff)	Revised and Title changed (does not have a "/" in title)

Appendix C –

Procedure	Procedure Title	Modification to PMO Plan
119402	119402 - Emergency Shutdown With No Evacuation	Deleted, actions are now covered in 119505
119500	119500 - H2S Alarm Procedure	Was not included in previous PMO Plan
119501	119501 - Low Oxidizer Temperature and/or Oxidizer Flameout	Was not included in previous PMO Plan
119502	119502 - Bomb Threat Procedure	Was not included in previous PMO Plan
119503	119503 - Reaction to A-Train and/or B-Train Shutdown	New Procedure
119505	119505 - Emergency Shutdown Caused By Complete Power Outage	Was 119403
119506	119506 - Emergency Shutdown of C/D MEA Regenerators	Was 119404
119507	119507 - MEA Regenerator Emergency Shutdown Guidelines	Was 119405
121501	121501 - Provide Continuous Combustion Of H2S During Loss Of Stretford Circulation	Was not included in previous PMO Plan
121502	121502 Relighting The Combuster With The Train On Stream And Stretford Circulating	Was not included in previous PMO Plan
121503	121503 Relighting The Combuster With The Train On Stream And Stretford Circulating With The Portable Ignitor Device	Was not included in previous PMO Plan
121504	121504 Provide Continuous Combustion Of H2S During Planned Shutdown Of Stretford Circulation	Was not included in previous PMO Plan
121505	121505 Low Combuster Temperature And/Or Combuster Flameout	Was not included in previous PMO Plan
121506	121506 Bomb Threat Procedure	Was not included in previous PMO Plan
121507	121507 - Reaction to C or D Train Trip	New Procedure
121508	121508 - Reaction to C and D Train Trip	New Procedure
121509	121509 - Emergency Shutdown With No Evacuation	Was 121402
121510	121510 Oxygen Shutdown at C Train	Was 121421
121511	121511 - Oxygen Shutdown at D Train	Was 121422

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Attachment 6

Flaring Incidents

Lemont Refinery
CITGO Petroleum Corporation
Hydrocarbon Flaring RCA Corrective Action Status Summary
July 1, 2012 – December 31, 2012

Incident Date (end)	Incident Number	RCA Completed	Corrective Action Completion Date	Corrective Action Expected Completion Date	Comments
8/7/2012	LE-HC-05-2012-080712	9/20/2012	8/2012	8/2012	Appendix A
8/10/2012	LE-HC-06-2012-081012	9/20/2012	9/2012	9/2012	Appendix B
9/20/2012	LE-HC-07-2012-092012	10/23/2012	9/2012	9/2012	Appendix C
10/1/2012	LE-HC-08-2012-100112	10/25/2012	10/2012	10/2012	Appendix D
10/22/2012	LE-HC-09-2012-102112	11/27/2012	10/2012	10/2012	Appendix E
11/10/2012	LE-HC-10-2012-110312	12/13/2012	11/2012	11/2012	Appendix F
11/25/2012	LE-HC-10-2012-110312	12/13/2012	11/2012	11/2012	Appendix F
12/2/2012	LE-AG-12-2012-120212	1/11/2013	To be determined	12/2015	The corrective action information for this Acid Gas flaring event is included for completeness. The RCA for this Acid Gas Flaring event is not included with this report, as it was submitted separately, pursuant to ¶79 of the Consent Decree.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 8/07/2012
RCA Completed 09/20/2012**

Incident Number: LE-HC-05-2012-080712

Brief Description of Incident

At approximately 7:01 AM on August 7, 2012, intermittent flaring occurred at the 844C-3 flare due to FCCU startup activities and a coincidental compressor issue at the Saturated Gas Plant (U217). The intermittent flaring ended around 2:11 PM on the same day.

1. FCC Start up flaring:

Due to startup activities, intermittent flaring from the FCC started at 7:01 AM. Feed was started to the FCC riser at 12:17 PM. The FCC re-start was necessary as the unit had been down since July 28, when the FCC was shutdown in a controlled manor to repair the spent catalyst standpipe. The restart followed standard procedures.

2. Sat Gas Compressor Flaring:

From 11:06 AM until 11:15 AM, the Diesel Hydrotreater Stripper Overhead Knockout Drum (25F-3) vapors were sent to the flare. This was done manually when the Saturated Gas Plant Compressor (17GB-1A) unloaded during the replacement of a solenoid valve. The header pressured up and the vapor stream was sent to the flare for a short period.

C-3 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	8/07/2012	Incident Start Time:	07:01
Incident End Date:	8/07/2012	Incident End Time:	14:11

Estimated SO₂ Emissions:	0.7 tons	Estimated SO₂ Emission Rate:	209.4 lbs/hr
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Calculations per Paragraph 92

C-3 flaring (8/7/12 7:01 a.m. – 8/7/12 2:11 p.m.)

$$\begin{aligned} \text{Tons of SO}_2 \text{ Emitted} &= [\text{FR}][\text{TD}][\text{ConcH}_2\text{S}][8.44 \times 10^{-5}] \\ &= [39,459.1 \text{ SCFH}] [7.17 \text{ hrs}] [0.0314 \text{ scf H}_2\text{S/scf gas}] [8.44 \times 10^{-5}] = 0.7 \text{ Tons} \\ \text{Rate of SO}_2 \text{ emissions in lbs/hr} &= [\text{FR}][\text{ConcH}_2\text{S}][0.169] \\ &= [39,459.1 \text{ SCFH}] [0.0314 \text{ scf H}_2\text{S/scf gas}] [0.169] = 209.4 \text{ lbs of SO}_2/\text{hr} \end{aligned}$$

Meanings of variables and derivation of multipliers used in the above equations are as listed in paragraph 92.c. of the Consent Decree

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 8/07/2012
RCA Completed 09/20/2012**

Steps taken to limit the duration and/or quantity of sulfur dioxide emissions

1. FCC Startup Flaring-

The FCC startup followed standard procedures. The flaring was intermittent as units were brought back online.

2. Saturated Gas Plant Compressor

The solenoid valve for the Saturated Gas Plant Compressor was replaced and compressor was re-loaded to allow vapors to be routed back to the compressor.

Root Cause and significant contributing cause(s)

1. FCC Startup Flaring-

The FCC startup and associated flaring was necessitated because the FCCU had experienced an unplanned shutdown to repair the spent catalyst stand pipe.

2. Saturated Gas Plant Compressor

Flaring occurred during the replacement of a failed solenoid valve. This was replaced following normal maintenance procedures.

Measures to prevent a recurrence of a similar event and proposed corrective actions

1. FCC Startup Flaring-

Evaluate and modify startup procedures and methods to minimize flaring during normal start-ups.

2. Saturated Gas Plant Compressor

Improve communication during maintenance activities.

Action Commencement and Completion Dates

Action	Commencement Dates [mm/yr]	Target Completion Date [mm/yr]	Completion Dates [mm/yr]
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**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 8/07/2012
RCA Completed 09/20/2012**

1a. Develop an Unsaturated Gas Plant Startup Procedure.	08/12	08/12	08/12
1b. Install a line to route Debutanizer Bottoms Material (wild FCC Gasoline) back to the FCC Fractionator OVHD drum to reduce liquid transfers to the pump out system.	08/12	08/12	08/12

Stipulated penalty determination statement

The stipulated penalty determination statement is not required for the Hydrocarbon Flaring Incident that occurred on 8/07/2012.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 8/10/2012
RCA Completed 09/20/2012**

Incident Number: LE-HC-06-2012-081012

Brief Description of Incident

At approximately 7:47 a.m. on August 10, 2012, flaring occurred at the 844C-3 flare when the coker compressor shutdown on a false trip from the local high level switch (13LSHH-737) on the 113F-4 dry end. The high level switch was checked out by the Instrumentation Department, no defects were found and the compressor was re-started, ending the flaring at 8:31 a.m.

C-3 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	8/10/2012	Incident Start Time:	07:47
Incident End Date:	8/10/2012	Incident End Time:	08:31

Estimated SO₂ Emissions:	2.3 tons	Estimated SO₂ Emission Rate:	6,399.8 lbs/hr
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Calculations per Paragraph 92

C-3 flaring (8/10/12 7:47 a.m. – 8/10/12 8:31 a.m.)

$$\text{Tons of SO}_2 \text{ Emitted} = [\text{FR}][\text{TD}][\text{ConcH}_2\text{S}][8.44 \times 10^{-5}]$$

$$= [412,065.0 \text{ SCFH}] [0.73 \text{ hrs}] [0.0919 \text{ scf H}_2\text{S/scf gas}] [8.44 \times 10^{-5}] = 2.3 \text{ Tons}$$

$$\text{Rate of SO}_2 \text{ emissions in lbs/hr} = [\text{FR}][\text{ConcH}_2\text{S}][0.169]$$

$$= [412,065.0 \text{ SCFH}] [0.0919 \text{ scf H}_2\text{S/scf gas}] [0.169] = 6,399.8 \text{ lbs of SO}_2/\text{hr}$$

Meanings of variables and derivation of multipliers used in the above equations are as listed in paragraph 92.c. of the Consent Decree

Steps taken to limit the duration and/or quantity of sulfur dioxide emissions

The unit was started up after the safety systems were verified to be operating properly; levels were confirmed and the associated instrumentation was checked to ensure it was safe to re-start the compressor.

Root Cause and significant contributing cause(s)

Root cause of the of the flaring was from the compressor shutdown due to the 113F-4 Overhead Accumulator Drum Dry End high level shutdown (13LSHH-737), as verified by the unit operators on the compressor first out panel.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 8/10/2012
RCA Completed 09/20/2012**

Measures to prevent a recurrence of a similar event and proposed corrective actions

The systems associated with the 113F-4 Overhead Accumulator Drum Dry End high level shutdown (13LSHH-737) were evaluated to ensure they were in proper working order. This included:

- Performing an evaluation on the Level Shutdown Switch, including checking for loose wires or moisture in the electronics. No issues were found.
- Verifying the integrity of the wiring from the Level Shutdown Switch to the computer system. No issues were found.

The cause of the false indication from shutdown switch (13LSHH-737) is still unknown. However, it was recorded during the investigation that an Insulator Craftsmen was working around the switch at the time of the trip.

Action Commencement and Completion Dates

Action	Commencement Dates [mm/yr]	Target Completion Date [mm/yr]	Completion Dates [mm/yr]
1. Bypass the level switch 13LSHH-737 when working on the instrument	9/12	9/12	9/12

Stipulated penalty determination statement

The stipulated penalty determination statement is not required for the Hydrocarbon Flaring Incident that occurred on 8/10/2012.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 9/20/2012
RCA Completed 10/23/2012**

Incident Number: LE-HC-07-2012-092012

Brief Description of Incident

At approximately 7:28 a.m. on September 20, 2012, flaring occurred at the 844C-3 flare when the flare gas compressor shutdown due to a false low lube oil pressure indication. The restart of the compressor was delayed due to an electrical issue in the substation. Once the instrumentation and electrical repairs were completed, the compressor was re-started ending the flaring at 3:24 p.m.

C-3 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	9/20/2012	Incident Start Time:	07:28
Incident End Date:	9/20/2012	Incident End Time:	15:24

Estimated SO₂ Emissions:	1.3 tons	Estimated SO₂ Emission Rate:	328.7 lbs/hr
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Calculations per Paragraph 92

C-3 flaring (9/20/12 7:28 a.m. – 9/20/12 15:24 a.m.)

$$\begin{aligned}\text{Tons of SO}_2 \text{ Emitted} &= [\text{FR}][\text{TD}][\text{ConcH}_2\text{S}][8.44 \times 10^{-5}] \\ &= [95,192.7 \text{ SCFH}] [7.95 \text{ hrs}] [0.0204 \text{ scf H}_2\text{S/scf gas}] [8.44 \times 10^{-5}] = 1.3 \text{ Tons}\end{aligned}$$

$$\begin{aligned}\text{Rate of SO}_2 \text{ emissions in lbs/hr} &= [\text{FR}][\text{ConcH}_2\text{S}][0.169] \\ &= [95,192.7 \text{ SCFH}] [0.0204 \text{ scf H}_2\text{S/scf gas}] [0.169] = 328.7 \text{ lbs of SO}_2/\text{hr}\end{aligned}$$

Meanings of variables and derivation of multipliers used in the above equations are as listed in paragraph 92.c. of the Consent Decree

Steps taken to limit the duration and/or quantity of sulfur dioxide emissions

Troubleshooting and repair of the instrument issue and subsequent electrical issues were ongoing until compressor was restarted.

Root Cause and significant contributing cause(s)

Root cause of the flaring was from the flare gas compressor shutdown caused by a false low lube oil pressure indication. The delayed restart was caused by a corroded resistor inside the substation.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 9/20/2012
RCA Completed 10/23/2012**

Measures to prevent a recurrence of a similar event and proposed corrective actions

The false low lube oil pressure indication was likely caused by corrosion to the contacts between an optocoupler and circuit board in the instrument panel. The optocoupler and circuit board were replaced which removed all corrosion products. Electrical components were checked for proper operation prior to restart of the compressor. A one-second time delay was also added to the lube oil pressure shutdown logic to prevent a momentary false signal from shutting down the compressor.

At the substation, the resistor was cleaned and the electrical components were checked for proper operation prior to restart.

Action Commencement and Completion Dates

Action	Commencement Dates [mm/yr]	Target Completion Date [mm/yr]	Completion Dates [mm/yr]
1. Troubleshoot and repair components causing shutdown and preventing restart	09/12	09/12	09/12
2. Add a one-second time delay to 44P-4322\43I-4322 Low Lube Oil Shutdown logic on the DCS.	09/12	09/12	09/12

Stipulated penalty determination statement

The stipulated penalty determination statement is not required for the Hydrocarbon Flaring Incident that occurred on 9/20/2012.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 10/01/2012
RCA Completed 10/25/2012**

Incident Number: LE-HC-08-2012-100112

Brief Description of Incident

At approximately 5:47 a.m. on October 1, 2012, flaring occurred at the 844C-2 and 844C-3 flares when the Crude Unit Desalter had an issue. A wash water flow meter to the first stage Desalter failed, causing water rate to increase. This additional water resulted in a water/oil emulsion that carried into the atmospheric tower, which caused the atmospheric tower to pressure up and vent to the flare header. The flare gas compressor shutdown during the event due to a high volume of light liquids. The venting from the crude unit stopped at 7:28 a.m. and the flare gas compressor was restarted; causing the flaring to end at 8:02 a.m.

C-2 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	10/01/2012	Incident Start Time:	05:54
Incident End Date:	10/01/2012	Incident End Time:	07:08

Estimated SO₂ Emissions:	0.3 tons	Estimated SO₂ Emission Rate:	427.4 lbs/hr
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C-3 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	10/01/2012	Incident Start Time:	05:47
Incident End Date:	10/01/2012	Incident End Time:	08:02

Estimated SO₂ Emissions:	6.7 tons	Estimated SO₂ Emission Rate:	6028.6 lbs/hr
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Calculations per Paragraph 92

C-2 flaring (10/01/12 5:54 a.m. – 10/01/12 7:08 a.m.)

Tons of SO₂ Emitted = [FR][TD][ConcH₂S][8.44 x 10⁻⁵]
= [29,886.0 SCFH] [1.23 hrs] [0.0846 scf H₂S/scf gas] [8.44 x 10⁻⁵] = 0.3 Tons
Rate of SO₂ emissions in lbs/hr = [FR][ConcH₂S][0.169]
= [29,886.0 SCFH] [0.0846 scf H₂S/scf gas] [0.169] = 427.4 lbs of SO₂/hr

C-3 flaring (10/01/12 5:47 a.m. – 10/01/12 8:02 a.m.)

Tons of SO₂ Emitted = [FR][TD][ConcH₂S][8.44 x 10⁻⁵]
= [423,160.6 SCFH] [2.25 hrs] [0.0843 scf H₂S/scf gas] [8.44 x 10⁻⁵] = 6.7 Tons
Rate of SO₂ emissions in lbs/hr = [FR][ConcH₂S][0.169]
= [423,160.6 SCFH] [0.0834 scf H₂S/scf gas] [0.169] = 6028.6 lbs of SO₂/hr

Meanings of variables and derivation of multipliers used in the above equations are as listed in paragraph 92.c. of the Consent Decree

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 10/01/2012
RCA Completed 10/25/2012**

Steps taken to limit the duration and/or quantity of sulfur dioxide emissions

Troubleshooting efforts continued through the event. Personnel were called out for troubleshooting assistance. Demulsifier injection rate was increased to help break the water/oil emulsion.

Root Cause and significant contributing cause(s)

The root cause of the flaring was the first stage Desalter wash water flow meter (11FE-1259) failed. The flow meter failure was due to the flow meter reconfiguring itself to a new set of conditions that caused the meter to read zero flow. It was determined the automatic reconfiguration was due to the local optical display buttons being triggered by atmospheric conditions (i.e. light/rain/dirt).

Measures to prevent a recurrence of a similar event and proposed corrective actions

1. The local optical display panel was removed from 11FE-1259 and locked out from 6 other similar flow meters in the plant.
2. An alarm was installed on 11F-1259 to alert the operator of a setpoint deviation. A similar alarm was installed on 4 other flow meters used for control.

Action Commencement and Completion Dates

Action	Commencement Dates [mm/yr]	Target Completion Date [mm/yr]	Completion Dates [mm/yr]
Item 1 from above	10/12	10/12	10/12
Item 2 from above	10/12	10/12	10/12

Stipulated penalty determination statement

The stipulated penalty determination statement is not required for the Hydrocarbon Flaring Incident that occurred on 10/01/2012.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 10/21/2012
RCA Completed 11/27/2012**

Incident Number: LE-HC-09-2012-102112

Brief Description of Incident

At approximately 9:25 p.m. on October 21, 2012, flaring occurred at the 844C-2 flare when the flare gas compressor shutdown due to a dead short of resistor in the control panel. Once the electrical system was tested and the repairs were completed, the compressor was re-started ending the flaring at approximately 2:08 a.m. on October 22.

C-3 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	10/21/2012	Incident Start Time:	9:35 p.m.
Incident End Date:	10/22/2012	Incident End Time:	2:08 a.m.

Estimated SO₂ Emissions:	1.8 tons	Estimated SO₂ Emission Rate:	302.6 lbs/hr
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Calculations per Paragraph 92

C-3 flaring (10/21/12 9:35 p.m. – 10/22/12 2:08 a.m.)

$$\begin{aligned}\text{Tons of SO}_2 \text{ Emitted} &= [\text{FR}][\text{TD}][\text{ConcH}_2\text{S}][8.44 \times 10^{-5}] \\ &= [39,437.8 \text{ SCFH}] [11.8 \text{ hrs}] [0.0454 \text{ scf H}_2\text{S/scf gas}] [8.44 \times 10^{-5}] = 1.8 \text{ Tons} \\ \text{Rate of SO}_2 \text{ emissions in lbs/hr} &= [\text{FR}][\text{ConcH}_2\text{S}][0.169] \\ &= [39,437.8 \text{ SCFH}] [0.0454 \text{ scf H}_2\text{S/scf gas}] [0.169] = 302.6 \text{ lbs of SO}_2/\text{hr}\end{aligned}$$

Meanings of variables and derivation of multipliers used in the above equations are as listed in paragraph 92.c. of the Consent Decree

Steps taken to limit the duration and/or quantity of sulfur dioxide emissions

Troubleshooting and repair of the electrical system components were ongoing until compressor was restarted.

Root Cause and significant contributing cause(s)

Root cause of the flaring was from the flare gas compressor shutdown caused by a short of a resistor in the control panel.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 10/21/2012
RCA Completed 11/27/2012**

Measures to prevent a recurrence of a similar event and proposed corrective actions

The short was likely caused by corrosion on the connecting band which lead to a loss of insulation causing the failure of the resistor. The resistor and band were replaced and the electrical components were checked for proper operation prior to restart.

Testing was also performed on the electrical system including the exciter coil and wiring for proper operation prior to restart of the compressor.

Action Commencement and Completion Dates

Action	Commencement Dates [mm/yr]	Target Completion Date [mm/yr]	Completion Dates [mm/yr]
1. Troubleshoot and repair components causing shutdown	10/12	10/12	10/12
2. Replace resistor and band	10/12	10/12	10/12

Stipulated penalty determination statement

The stipulated penalty determination statement is not required for the Hydrocarbon Flaring Incident that occurred on 10/21/2012.

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 11/03/2012
RCA Completed 12/13/2012**

Incident Number: LE-HC-10-2012-110312

Brief Description of Incident

At approximately 2:37 a.m. on November 3, 2012, flaring occurred at the 844C-2 flare when the South Plant Flare Gas Recovery Compressor (844GB-401) was shut-down to perform planned preventive maintenance. The maintenance was initiated based on run length and indicators used to determine the need to inspect and overhaul the compressor. The prior compressor maintenance event began April 9, 2012. The primary scope of this maintenance outage was to:

- Replace all 40 compressor valves, piston rings and piston rider bands for all 3 cylinders
- Repair the 2nd Stage Compressor Throw; which included re-machining the 2nd Stage Cylinder Liner and repairing the 2nd Stage Crosshead

The flaring ended at C-2 at 6:15 a.m. on November 10, after the flaring had been switched to 844C-3 flare at 6:06 a.m. that day. The C-3 flaring ended briefly on November 15, 2012 at 2:49 p.m., after the completion of maintenance work and re-start of the compressor.

Several hours after the re-start, it became apparent that further repairs were required, so the compressor was shut down again on November 15, 2012, with flaring at C-3 resuming at 5:04 p.m. The compressor was shut down due to instrumentation reading and audible noises that indicated that the compressor had an internal issue.

The compressor was successfully re-started on November 23, 2012, with flaring at C-3 ending at 8:30 a.m.

Subsequent to the successful re-start of the compressor, the Fluid Catalytic Cracking Unit (FCCU) experienced an unplanned shutdown by automated shutdown systems. Brief flaring occurred at C-3 for approximately 7 minutes beginning at 4:26 p.m. (contributing approximately 10 lb SO₂) during the unit re-start, which followed standard procedures. This brief flaring is included in the C-3 portion of the incident because it occurred within the 24-hour clock

Flaring ended at 4:33 p.m. on November 23, 2012.

C-2 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	11/03/2012	Incident Start Time:	02:37
Incident End Date:	11/10/2012	Incident End Time:	06:15

Estimated SO₂ Emissions:	28.7 tons	Estimated SO₂ Emission Rate:	333.1 lbs/hr
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C-3 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	11/10/2012	Incident Start Time:	06:06
Incident End Date:	11/23/2012	Incident End Time:	16:33

Estimated SO₂ Emissions:	79.0 tons	Estimated SO₂ Emission Rate:	490.8 lbs/hr
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**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 11/03/2012
RCA Completed 12/13/2012**

Calculations per Paragraph 92

C-2 flaring (11/03/12 2:37 a.m. – 11/10/12 6:15 a.m.)

Tons of SO₂ Emitted = [FR][TD][ConcH₂S][8.44 x 10⁻⁵]
= [117,304.9 SCFH] [171.63 hrs] [0.0168 scf H₂S/scf gas] [8.44 x 10⁻⁵] = 28.7 Tons
Rate of SO₂ emissions in lbs/hr = [FR][ConcH₂S][0.169]
= [117,304.9 SCFH] [0.0168 scf H₂S/scf gas] [0.169] = 333.1 lbs of SO₂/hr

C-3 flaring (11/10/12 6:06 a.m. – 11/23/12 4:33 p.m.)

Tons of SO₂ Emitted = [FR][TD][ConcH₂S][8.44 x 10⁻⁵]
= [118,538.4 SCFH] [322.45 hrs] [0.0245 scf H₂S/scf gas] [8.44 x 10⁻⁵] = 79.0 Tons
Rate of SO₂ emissions in lbs/hr = [FR][ConcH₂S][0.169]
= [118,538.4 SCFH] [0.0245 scf H₂S/scf gas] [0.169] = 490.8 lbs of SO₂/hr

Meanings of variables and derivation of multipliers used in the above equations are as listed in paragraph 92.c. of the Consent Decree

Steps taken to limit the duration and/or quantity of sulfur dioxide emissions

- Reliefs to the flare header and purges were minimized prior to and during the compressor maintenance period and refinery operations were held steady during the period.
- Necessary parts were on-hand prior to commencing the work, and the work was performed continuously throughout the maintenance period.
- Standard shutdown and startup procedures at the FCCU were followed.

Root Cause and significant contributing cause(s)

1. **Planned Maintenance Outage.** This was a planned maintenance outage, consistent with Paragraph 75.a. of the Consent Decree in which "The Parties recognize that periodic maintenance may be required for properly designed and operated flare gas recovery systems." The five prior maintenance outages had been on April 9, 2012 (7 days), July 25, 2011 (15 days), October 6, 2008 (13 days – Complete Overhaul), April 2007 (6 days – partial compressor inspection and overhaul), and June 2005 (aftercooler exchanger maintenance). This outage was necessary to ensure continued good compressor operations.
2. **Subsequent Maintenance Outage.** The compressor was shut down hours after the compressor was started up following the planned maintenance event. Two repair issues were discovered after the initial planned compressor outage. These were:
 - a. Improper installation of the end caps for the wrist pin assembly on the 2nd Stage Compressor Throw.
 - b. 1st Stage piston damage due to unnecessary hardware remaining in the cylinder after repair was complete.
3. **FCCU startup.** The FCCU startup followed standard procedures designed to minimize

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 11/03/2012
RCA Completed 12/13/2012**

emissions, including minimize flaring. This was evidenced by the very low contribution (~10 lb SO₂) to the total SO₂ emissions for the overall event.

Measures to prevent a recurrence of a similar event and proposed corrective actions

1. **Planned Maintenance Outage.** This was a planned maintenance outage, consistent with Paragraph 75.a. of the Consent Decree in which “The Parties recognize that periodic maintenance may be required for properly designed and operated flare gas recovery systems.” The five prior maintenance outages had been on April 9, 2012 (7 days), July 25, 2011 (15 days), October 6, 2008 (13 days – Complete Overhaul), April 2007 (6 days – partial compressor inspection and overhaul), and June 2005 (aftercooler exchanger maintenance). This outage was necessary to ensure continued good compressor operations.
2. **Subsequent Maintenance Outage.** The subsequent compressor outage was due to repair issues. Addressing these issues will be completed by additional training and additional post repair checks:
 - a. Additional training will be conducted with maintenance personnel on proper wrist pin installation.
 - b. Use a borescope to visually inspect that cylinders are free of foreign materials prior to installing suction valve covers.
3. **FCCU Startup.** Continue to follow standard procedures for FCCU re-start.

Action Commencement and Completion Dates

Action	Commencement Dates [mm/yr]	Target Completion Date [mm/yr]	Completion Dates [mm/yr]
1. Continue to monitor compressor conditions and perform periodic maintenance to ensure reliable compressor operations.	11/12	11/12	11/12
2a. Conducted training with maintenance personnel on proper wrist pin installation.	11/12	11/12	11/12
2b. Implement practice to use borescope to visually inspect cylinders are free of foreign materials prior to installing suction valve covers.	11/12	11/12	11/12
3. Continue to follow standard procedures for FCCU re-start.	11/12	11/12	11/12

Stipulated penalty determination statement

The stipulated penalty determination statement is not required for the Hydrocarbon Flaring Incident that occurred on 11/03/2012.

Lemont Refinery
CITGO Petroleum Corporation
Semi-Annual Report
July 1, 2012 – December 31, 2012

Attachment 7

Summary of BWON Requirements

Sample Number	Equipment Description	Controlled/Uncontrolled	Percent Aqueous	Percent Organic	Hydrocarbon Specific Gravity	Benzene Concentration Aqueous (mg/L)	Benzene Concentration Organic (mg/kg)	Total Benzene in Waste (ppmw)	Volume (gal/qr)	6.0 Mg Compliance Option	Type of Sample
North Plant											
13	Udex Lift Station Unit -122	Uncontrolled	100.0	0.0	0.728	0.70	0.0	0.696	5,837,005	0.01538	End of Line
14	Cat Reformer #1 Unit 123 Lift Station	Uncontrolled	100.0	0.0	0.728	0.005	0.0	0.005	5,837,005	0.00011	End of Line
12	Solvent Truck Rack Lift Station	Uncontrolled	100.0	0.0	0.728	0.006	0.0	0.006	5,837,005	0.00013	End of Line
20	South French Drain Lift Pump	Uncontrolled	97.1	2.9	0.728	0.010	1.4	0.010	2,149,267	0.00032	End of Line
21	North French Drain Lift Pump	Uncontrolled	100.0	0.0	0.728	0.007	0.0	0.007	4,853,184	0.00013	End of Line
16	Needle Coker Lift Pumps	Uncontrolled	88.8	11.2	0.728	0.005	3.4	0.010	5,837,005	0.00622	End of Line
TK 003	Tank 3 Water	Uncontrolled	100.0	0.0	0.795	0.010	0.0	0.010	1,387,728	0.00005	End of Line
GRW-1, 2	Groundwater	Uncontrolled	100.0	0.0	0.728	0.005	0.0	0.005	22,443	0.00000	End of Line
GQ-MW-2A	Groundwater	Uncontrolled	100.0	0.0	0.728	0.005	0.0	0.005	23,885	0.00000	End of Line
South Plant											
1	U212 + cleaning pad	Uncontrolled	100.0	0.0	0.728	0.030	0.0	0.030	5,353,158	0.00061	End of Line
2	U-112	Uncontrolled	88.4	11.6	0.728	0.245	36.5	0.300	5,353,158	0.06681	>0.05 Mg/yr
3	U-217	Uncontrolled	100.0	0.0	0.728	0.013	0.0	0.013	5,353,158	0.00026	End of Line
4	U-111	Uncontrolled	99.5	0.5	0.728	0.015	0.1	0.015	5,353,158	0.00031	End of Line
5	U-111	Uncontrolled	100.0	0.0	0.728	1.350	0.0	1.350	5,353,158	0.02735	End of Line
6	U-13	Uncontrolled	100.0	0.0	0.728	0.018	0.0	0.018	5,353,158	0.00036	End of Line
7	U-15/25	Uncontrolled	100.0	0.0	0.728	0.068	0.0	0.068	5,353,158	0.00138	End of Line
8	U-14/16	Uncontrolled	100.0	0.0	0.728	0.006	0.0	0.006	5,353,158	0.00012	End of Line
9	Maintenance/cleaning pad	Uncontrolled	100.0	0.0	0.728	0.005	0.0	0.005	5,353,158	0.00010	End of Line
10	Laboratory	Uncontrolled	100.0	0.0	0.728	0.304	0.0	0.304	5,353,158	0.00616	End of Line
11	U102	Uncontrolled	100.0	0.0	0.728	0.005	0.0	0.005	5,353,158	0.00010	End of Line
46	U103/104	Uncontrolled	100.0	0.0	0.728	0.347	0.0	0.347	5,353,158	0.00703	End of Line
47	U590	Uncontrolled	100.0	0.0	0.728	0.005	0.0	0.005	5,353,158	0.00010	End of Line
38	Tank 433 Water to sewer	Uncontrolled	100.0	0.0	0.728	0.00	0.0	0.000	0	0.00000	End of Line
43	Tank 434 Water to sewer	Uncontrolled	100.0	0.0	0.728	23.17	0.0	23.17	91	0.00001	End of Line
NA	Blend Center Pit	Uncontrolled	100.0	0.0	0.728	0.005	10380.0	0.01	614,972	0.00001	End of Line
37	B&T Coker Road Lift Station	Uncontrolled	100.0	0.0	0.728	0.475	0.0	0.48	51,743,346	0.09303	>0.05 Mg/yr

**Total Quarterly
Benzene**

0.22609

Sample Number	Equipment Description	Controlled/Uncontrolled	Percent Aqueous	Percent Organic	Hydrocarbon Specific Gravity	Benzene Concentration Aqueous (mg/L)	Benzene Concentration Organic (mg/kg)	Total Benzene in Waste (ppmw)	Volume (gal/qtr)	6.0 Mg Compliance Option	Type of Sample
North Plant											
13	Udex Lift Station Unit -122	Uncontrolled	100.0	0.0	0.728	0.11	0.0	0.106	4,032,621	0.00162	End of Line
14	Cat Reformer #1 Unit 123 Lift Station	Uncontrolled	100.0	0.0	0.728	0.017	0.0	0.017	4,032,621	0.00026	End of Line
12	Solvent Truck Rack Lift Station	Uncontrolled	100.0	0.0	0.728	0.003	0.0	0.003	4,032,621	0.00005	End of Line
20	South French Drain Lift Pump	Uncontrolled	100.0	0.0	0.728	0.003	0.0	0.003	4,233,282	0.00005	End of Line
21	North French Drain Lift Pump	Uncontrolled	100.0	0.0	0.728	0.003	0.0	0.003	2,079,936	0.00002	End of Line
16	Needle Coker Lift Pumps	Uncontrolled	87.3	12.7	0.728	0.015	4.8	0.023	4,032,621	0.00702	End of Line
TK 003	Tank 3 Water	Uncontrolled	100.0	0.0	0.728	0.030	0.0	0.030	1,397,144	0.00016	End of Line
GRW-1, 2	Groundwater	Uncontrolled	100.0	0.0	0.728	0.001	0.0	0.001	26,772	0.00000	End of Line
GQ-MW-2A	Groundwater	Uncontrolled	100.0	0.0	0.728	0.005	0.0	0.005	13,877	0.00000	End of Line
South Plant											
1	U212 + cleaning pad	Uncontrolled	100.0	0.0	0.728	0.003	0.0	0.003	3,201,386	0.00004	End of Line
2	U-112	Uncontrolled	100.0	0.0	0.728	0.113	0.0	0.113	3,201,386	0.00137	End of Line
3	U-217	Uncontrolled	100.0	0.0	0.728	0.194	0.0	0.194	3,201,386	0.00235	End of Line
4	U-111	Uncontrolled	100.0	0.0	0.728	1.378	0.0	1.378	3,201,386	0.01670	End of Line
5	U-111	Uncontrolled	100.0	0.0	0.728	4.498	0.0	4.498	3,201,386	0.05450	>0.05 Mg/yr
6	U-13	Uncontrolled	100.0	0.0	0.728	0.025	0.0	0.025	3,201,386	0.00030	End of Line
7	U-15/25	Uncontrolled	100.0	0.0	0.728	0.037	0.0	0.037	3,201,386	0.00045	End of Line
8	U-14/16	Uncontrolled	100.0	0.0	0.728	0.016	0.0	0.016	3,201,386	0.00019	End of Line
9	Maintenance/cleaning pad	Uncontrolled	100.0	0.0	0.728	0.004	0.0	0.004	3,201,386	0.00005	End of Line
10	Laboratory	Uncontrolled	100.0	0.0	0.728	0.472	0.0	0.472	3,201,386	0.00572	End of Line
11	U102	Uncontrolled	100.0	0.0	0.728	0.007	0.0	0.007	3,201,386	0.00008	End of Line
46	U103/104	Uncontrolled	100.0	0.0	0.728	0.515	0.0	0.515	3,201,386	0.00624	End of Line
47	U590	Uncontrolled	100.0	0.0	0.728	0.009	0.0	0.009	3,201,386	0.00011	End of Line
38	Tank 433 Water to sewer	Uncontrolled	100.0	0.0	0.728	0.00	0.0	0.000	0	0.00000	End of Line
43	Tank 434 Water to sewer	Uncontrolled	100.0	0.0	0.728	27.00	0.0	27.00	91	0.00001	End of Line
NA	Blend Center Pit	Uncontrolled	100.0	0.0	0.728	0.005	10380.0	0.01	508,723	0.00001	End of Line
37	B&T Coker Road Lift Station	Uncontrolled	100.0	0.0	0.728	0.073	0.0	0.07	46,824,909	0.01294	End of Line

**Total Quarterly
Benzene**

0.11023

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Attachment 8

LDAR Issues Summary

CITGO Petroleum Corporation
Lemont Refinery
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SUMMARY OF LDAR ISSUES IN 2ND HALF 2012 NSR CONSENT DECREE REPORT

Late initial repair attempt, late initial re-monitoring

Pumps (in light liquid service) and Valves (in light liquid and/or gas vapor service, and other than pressure relief devices) leaking at Internal Leak Threshold and with no initial repair attempt and/or re-monitoring within 5 days of initial detection

Compliance Group	Tag	Class	Date Reported	First Attempt Due Date	Initial Repair Date	Initial Retest Date	Issue	Note
No Pumps (in light liquid service) and Valves (in light liquid and/or gas vapor service, and other than pressure relief devices) leaking at Internal Leak Threshold had, within 5 days of initial detection, no initial repair attempt and/or re-monitoring.								

Pumps (in light liquid service) and Valves (in light liquid and/or gas-vapor service, and other than pressure relief devices) leaking above internal threshold not repaired within 30 days or placed on Delay of Repair List

Compliance Group	Tag	Class	Date Reported	Effective Repair Due Date	Actual Repair Date		Issue	Note
No Pumps (in light liquid service) and Valves (in light liquid and/or gas-vapor service, and other than pressure relief devices) leaking above internal threshold were, within 30 days of detection, not repaired or placed on Delay of Repair List or removed from service.								

Late placement on DOR (> 30 days after initial inspection) during reporting period.

Compliance Group	Tag	Class	Initial Inspection Date	DOR deadline	Date placed on Delay of Repair		Issue	Note
No pumps or valves were placed on Delay of Repair (DOR) more than 30 days after initial inspection during reporting period.								

Late Initial Repair Threshold Attempt (leakers w/ leak rate > 200 ppmv but < 500 ppmv, w/ no repair/remonitor w/in 5 days of initial inspection)

Compliance Group	Tag	Class	Initial Inspection Date	Repair/Remonitor Deadline	Initial Repair Attempt Date	Initial Remonitor Date	Issue	Note
There were no Initial Repair Threshold Attempts (leakers w/ leak rate > 200 ppmv but < 500 ppmv) that were more than 5 days after the initial inspection.								

3rd Party LDAR Audit Issues

No audit was conducted during the reporting period.

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Attachment 9

LDAR

**Lemont Refinery
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ATTACHMENT 9

LDAR Summary

List of process units monitored during the reporting period [130(b)(i)]

The information is contained in the Refinery MACT/HON semi-annual report submitted to IEPA.

Number of valves and pumps present in each process unit [130(b)(ii)]

The information is contained in the Refinery MACT/HON semi-annual report submitted to IEPA.

Number of valves and pumps monitored in each process unit [130(b)(iii)]

The information is contained in the Refinery MACT/HON semi-annual report submitted to IEPA.

Number of valves and pumps found leaking [130(b)(iv)]

The information is contained in the Refinery MACT/HON semi-annual report submitted to IEPA.

Number of "Difficult to Monitor" pieces of equipment monitored [130(b)(v)]

See **Appendix A** (DTM Inspections)

Projected month and year of the next monitoring event for each unit [130(b)(vi)]

See **Appendix B** (Monitoring Schedule)

Current Delay of Repair items [130(b)(vii)]

The reporting requirements for this section relate to the injection requirements for components otherwise placed on "Delay of Repair" status described in paragraph 128.

The requirement to inject components became applicable on February 28, 2006.

See **Appendix C** (Delay of Repair information)

Initial Repair Attempt information [130(b)(viii)]

The reporting requirements for this section relate to the Initial Repair Attempt Leak Threshold described in paragraph 122.

The Initial Repair Attempt Threshold of 200 ppmv became applicable on September 30, 2005.

See **Appendix D** (Initial Repair Attempt) and related monthly details.

Internal Leak Threshold issues [130(b)(ix)]

The reporting requirements for this section relate to the Internal Leak Thresholds described in paragraphs 119 and 120b.

The Internal Leak Definition for Valves of 500 ppmv became applicable on February 28, 2006.

The Internal Leak Definition for Pumps of 2000 ppmv became applicable on February 28, 2006.

See **Appendix E** (Internal Leak Definition information)

Audit Finding Summary [118]

No 3rd party audit conducted during this reporting period.

See **Appendix F** (Audit Finding Summary)

ATTACHMENT 9, Appendix A
Difficult-to-Monitor Equipment
[130(b)(v)]

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Unit	Description	No. of LL/GV DTM pieces of equipment monitored during reporting period	Note
102	FCC Gasoline Hydrotreater		Bulk of DTM monitoring conduct March through May
103	Gasoline hydrotreater		
106	Coker 2 - vacuum		
107	Coker 2 - hydrotreater		
108	Coker 2 - coker		
109	Coker 2 - H2 unit		
111	Crude	35	
112	FCC	3	
113	Sponge coker	6	
114	Naphtha hydrotreater	1	
115	Lt. Distillate Hydrotreater		
116	CRU No. 2	4	
118	Unisar	2	
119	SRU -119	4	
120	Alky		
121	SRU - 121	4	
122	UDEX		
123	CRU No. 1	33	
125	Diesel hydrotreater		
153	Inter-unit pipe-way	41	
212	Unsat gas plant	4	
217	Sat gas plant		
228	Blend Center		
331	Tank Farm	63	
333	Canal Dock	4	
334	Santa Fe Car Rack		
335	Fuels Rack		
337	IC Tank Car Rack		
338	Solvents Truck Rack		
430	Water Treaters		
590	ULSD	13	
844	Waste water treatment/flare	109	
Total		326	

ATTACHMENT 9, Appendix B
LDAR Monitoring Schedule [130(b)(vi)]

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Revision Date: 1/28/13

KEY:	RS	Month that Regular Scheduled monitoring occurs
	DTMs	Difficult To Monitor component will be monitor
	TA	Month Turn Around is scheduled (p for partial)
	TA(cat)	Turn Around for catalyst work
	SD	Month Slow Down is scheduled (p for partial)
	AM	Adjusted Monitoring
		Month unit will be monitored
	1	Level 1 priority - monitoring completed within 1st week
	2	Level 2 priority - monitoring completed within 2nd week
	▲	Monitoring schedule adjusted forward

2012		1Q			2Q			3Q			4Q		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Unit	Unit Description												
102	Gasoline hydrotreater			RS+DTMs			RS			RS			RS
103	LSR Hydrotreater/Gasoline hydrotreater			RS+DTMs	1 AM	TA	▲ RS, pTA			RS			RS
106	Coker 2-vacuum			RS+DTMs			RS			RS			RS
107	Coker 2 - hydrotreater			RS+DTMs			RS			RS			RS
108	Coker 2 - coker			RS+DTMs			RS	TA(cat)		RS			RS
109	Coker2 - H2 (PSA)			RS+DTMs			RS			RS			RS
111	Crude		RS	DTMs	1 AM	RS, TA	▲ pTA		RS			RS	
112	FCC			RS+DTMs			RS			RS			RS
113	Sponge coker			RS+DTMs	1 AM	TA	▲ RS, pTA			RS			RS
114	Naphtha hydrotreater			RS+DTMs			RS			RS	AM		RS
115	Lt. Distillate Hydrotreater		RS	DTMs	1 AM	RS, TA	pTA	AM	RS			RS	
116	CRU No. 2			RS+DTMs			RS			RS	AM		RS
118	Unisar		RS	DTMs		RS			RS		TA	RS	
119	SRU -119		RS	DTMs	2 AM	RS, TA	pTA	AM	RS			RS	
120	Alky			RS+DTMs			RS			RS			RS
121	SRU - 121		RS	DTMs	2 AM	RS, TA	pTA	AM	RS			RS	
122	UDEX	RS		DTMs	RS			RS			RS		
123	CRU No. 1		RS	DTMs		RS			RS			RS	
125	Diesel hydrotreater		RS	DTMs	1 AM	RS, TA	pTA	AM	RS			RS	
212	Unsat gas plant			RS+DTMs			RS			RS			RS
217	Sat gas plant	RS		DTMs	1 RS	TA	pTA	RS			RS		
228	Blend Center		RS	DTMs		RS			RS			RS	
331	Tank Farm	RS		DTMs	RS			RS			RS		
333	Canal Dock	RS		DTMs	RS			RS			RS		
334	Santa Fe Car Rack		RS	DTMs		RS			RS			RS	
335	Fuels Rack		RS	DTMs		RS			RS			RS	
337	IC Tank Car Rack	RS			RS			RS			RS		
338	Solvents Truck Rack	RS			RS			RS			RS		
430	Water Treaters		RS	DTMs		RS			RS			RS	
590	Ultra Low Sulfur Diesel Hydrotreater	RS		DTMs	2 RS	SD	pSD	RS			RS		

The above schedule reflects the general period when the bulk of a unit's valves are to be monitored. Some components in units may not fall within the unit's general monthly schedule for a variety of reasons, including (but not limited to): being on follow-up re-monitor schedule, recently added and thus on a different schedule based on when they were added, on an annual monitoring frequency due to being "Difficult to Monitor", or shifted to or from a monthly monitoring schedule depending on HON leak rate. TBD ("To Be Determined") reflects the uncertainty regarding whether HON components will be on monthly or quarterly monitoring, depending on prior monitoring results.

ATTACHMENT 9, Appendix C
Delay of Repair Information
[130(b)(vii)]

Lemont Refinery
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Delay of Repair List

This is a list of those items currently on the Delay of Repair list (as of end of reporting period), placed there since February 28, 2006.

Component Number	Class	Description	Initial Inspection Date	Concentration (ppmv)	Date leaking > 10,000 ppmv	For valves leaking > 10,000 ppmv				Date placed on Delay of Repair	Placed on Delay of Repair by Unit Supervisor w/in 30 days?	Is LDAR monitoring continuing while on Delay of Repair	For pumps, were best efforts used to isolate and repair?
						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0102NSPSLL00235	VALVE	CONTROL VALVE 102FV-618, W of PUMP 102G-8A	09/17/2007	9,286	10/01/2007	Steam packing	3,966	09/17/2007	TIMELY	10/01/2007	TIMELY	Yes	NA
						Tighten packing	3,966	09/20/2007	TIMELY				
						Tighten packing	28,300	10/01/2007	TIMELY				
						Control valve - cannot inject							
0102NSPSGV00267	VALVE	102D-21 W SIDE OF TOWER 6TH LANDIN	04/08/2010	9649	04/13/2010	Tighten	17500	04/13/2010	TIMELY	04/23/2010	TIMELY	Yes	NA
						Tighten Packing	45700	4/22/2010					
						Control Valve - injection not appropriate							
0102NSPSLL00182	VALVE	102F-1 E SIDE OF VESSEL CONTROL VALVE 102FV-109	07/25/2011	1,071	NA	Steamed	5792	07/25/11	NA	08/09/2011	TIMELY	Yes	NA
0102NSPSLL00186	VALVE	CONTROL VALVE 102FV-110 ON N SIDE	5/10/2011	2621	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	5/16/2011	TIMELY	Yes	NA
0102NSPSLL00482	VALVE	AT PUMP 102G-22B OH CHK	06/06/2008	1,004	06/18/2008	Tighten flange	672	06/06/2008	TIMELY	06/21/2008	TIMELY	Yes	NA
						Previous repair	531	06/10/2008	TIMELY				
						Tighten flange	1,205	06/12/2008	TIMELY				
						Applied sealant	557	06/14/2008	TIMELY				
						Previous repair	53,000	06/18/2008	TIMELY				
						Replaced	8,578	06/21/2008	TIMELY				
						Leak source was flange -- not injectable.							
0102NSPSLL00797	VALVE	S OF PUMP 102G-2a IN PIPE ROW 15 FT OH LPB	06/06/2008	978	06/12/2008	Steam fitting	5,398	06/06/2008	TIMELY	06/21/2008	TIMELY	Yes	NA
						Tighten fitting	1,082	06/10/2008	TIMELY				
						Tighten fitting	51,900	06/12/2008	TIMELY				
						Applied sealant	1,335	06/14/2008	TIMELY				
						Previous repair	629	06/18/2008	TIMELY				
						Applied sealant	1,707	06/20/2008	TIMELY				
						Previous repair	1,599	06/21/2008	TIMELY				
0102NSPSLL00862	VALVE	S AT 102E-9	04/01/2009	10,900	04/01/2009	Leak source was screwed fitting on valve, not injectable							
						Tighten bonnet	19800	04/01/2009	TIMELY	04/15/2009	TIMELY	Yes	NA
						Tighten	2828	04/03/2009	TIMELY				
						Previous repair	4896	04/06/2009	TIMELY				
						Tighten	5139	04/07/2009	TIMELY				
						Inject	28200	04/09/2009	TIMELY				
						Previous repair	1301	04/14/2009	TIMELY				
0111NSPSGV00408	VALVE	BL UNIT FLARE VALVE N SIDE 2ND LEVEL OF BATTERY LIMITS	02/19/2003	2,336	NA	Placed on DOR before February 28, 2006							
0111NSPSGV00964	RELIEF	111D-1 ON TOP, PRESSURE RELIEF VALVE 111SV-935A	08/07/2012	42,000	NA	Tighten	34,650	08/09/2012	Not a Valve	08/10/2012	TIMELY	Yes	NA
0112NSPSGV00240	VALVE	TOP OF 112G-1A, 2ND LANDING, E SIDE OF BATTERY LIMITS	12/20/2007	2,411	12/20/2007	Steam seal	100,000	12/21/2007	TIMELY	01/04/2007	TIMELY	Yes	NA
						Tighten packing	1,394	01/02/2007	TIMELY				
0112NSPSGV00396	CONTROL	112XV-7911 112B-2 E SIDE OF HEATER ON PLATFORM	12/21/2012	1,196	NA	Steam packing	1,405	12/21/2012	NA	01/04/2013	TIMELY	Yes	NA

ATTACHMENT 9, Appendix C
Delay of Repair Information
[130(b)(vii)]

Lemont Refinery
CITGO Petroleum Corporation
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Delay of Repair List

This is a list of those items currently on the Delay of Repair list (as of end of reporting period), placed there since February 28, 2006.

Component Number	Class	Description	Initial Inspection Date	Concentration (ppmv)	Date leaking > 10,000 ppmv	For valves leaking > 10,000 ppmv				Date placed on Delay of Repair	Placed on Delay of Repair by Unit Supervisor w/in 30 days?	Is LDAR monitoring continuing while on Delay of Repair	For pumps, were best efforts used to isolate and repair?
						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0112NSPSGV00399	CONTROL	112XV-7908 112B-2 E SIDE OF HEATER ON PLATFORM	12/21/2012	670	NA	Steam packing	807	12/21/2012	NA	1/4/2013	TIMELY	Yes	NA
0113NSPSGV00821	VALVE	113FT-4154B W SIDE OF 113GB-1 COMPRESSOR OVERHEAD	6/20/2012	62100	6/20/2012	Steam packing	100,000	6/20/2012	NA	7/5/2012	TIMELY	Yes	NA
0114NSPSGV00190	VALVE	S SIDE OF D-1 REACTOR	08/01/2006	686	NA	This is an orifice tap valve - unable to inject.				08/15/2006	TIMELY	Yes	NA
0114NSPSGV00191	VALVE	BOTTOM OF 14-D1 REACTOR	12/06/2006	596	12/15/2006	Tighten	1,624	12/06/2006	Not > 10,000	12/21/2006	TIMELY	Yes	NA
						Tighten plug	2,312	12/08/2006	Not > 10,000				
						Sealant	100,000	12/15/2006	Not > 10,000				
						Sealant	1,579	12/18/2006	Not > 10,000				
						Previous repair	17,900	12/20/2006	Not > 10,000				
						Previous repair	16,700	12/21/2006	Not > 10,000				
0114NSPSGV00216	VALVE	114F-3 E SIDE OF VESSEL AT CONTROL LOOP 114PV-374A	05/08/2010	1,364	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	05/19/2010	TIMELY	Yes	NA
0114NSPSGV00392	COMPR	COMPRESSOR 114GB-1 SW OF STAEILLITE	04/29/2009	13,000	04/29/2009	Not a Valve	Not a Valve	Not a Valve	Not a Valve	05/15/2009	TIMELY	Yes	NA
0114NSPSLL00187	VALVE	AT CTL 14LV-725, SE SIDE OF F-3	10/15/2008	2,549	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/23/2007	TIMELY	Yes	NA
0114NSPSLL00188	VALVE	SE SIDE OF 14F-3 AT CTL 14LV-725	09/21/2008	1,483	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/05/2007	TIMELY	Yes	NA
0114NSPSLL00308	VALVE	12 FT HIGH 12 FT N SIDE OF G-8 PUMP	06/13/2008	1,220	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	06/23/2008	TIMELY	Yes	NA
0114NSPSLL00367	VALVE	25 FT HIGH 6 FT NW SIDE OF G-6 PUMP	05/02/2007	722	05/04/2007	Apply sealant	14,400	05/04/2007	TIMELY	05/23/2007	TIMELY	Yes	NA
						Previous repair	1,873	05/17/2007	TIMELY				
0114NSPSLL00434	RELIEF	SV-4002 UNDER N FFs	09/10/2008	1,600	NA	Not a Valve	Not a Valve	Not a Valve	Not a Valve	09/25/2008	TIMELY	Yes	NA
0114NSPSLL00604	VALVE	10 ft NORTH OF 114-F4 1st LANDING ORIFICE TAP AT 14FT-115	09/09/2008	32,700	09/09/2008	Steam packing	31800	09/09/2008	TIMELY	09/25/2008	TIMELY	Yes	NA
						Tighten packing	3875	09/11/2008	TIMELY				
						Tighten packing	1736	09/17/2008	TIMELY				
						Previous repair	2684	09/22/2008	TIMELY				
						Previous repair	9067	09/25/2008	TIMELY				
0114NSPSLL00608	VALVE	10 FT NORTH OF 116F-2 1ST LANDING ORIFICE TAP AT 114FT-157	06/13/2008	6,109	06/13/2008	Tighten packing	14,000	06/13/2008	TIMELY	06/23/2008	TIMELY	Yes	NA
						Tighten packing	2,431	06/18/2008	TIMELY				
						Apply sealant	603	06/20/2008	TIMELY				
0115NSPSGV00015	BALL VALV	115GB-7 E SIDE OF COMPRESSOR	11/16/2011	6,900	NA	Steam Packing	5,760	11/16/2011	NA	11/22/2011	TIMELY	Yes	NA
						This is a damaged ball valve - no injection							
0115NSPSLL00006	VALVE	W SIDE OF F-9	02/05/2009	1,042	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	02/20/2009	TIMELY	Yes	NA
0116NSPSGV00012	VALVE	EAST SIDE OF COMPRESSOR 116GB-1 ON LANDING AT PRESSURE INDICATOR	07/11/2008	6,029	07/15/2008	Tighten packing	8368	07/11/2008	TIMELY	07/28/2008	TIMELY	Yes	NA
						Tighten packing	20600	07/15/2008	TIMELY				
						Apply sealant	6992	07/17/2008	TIMELY				
						Needle valve - can not inject							

ATTACHMENT 9. Appendix C
Delay of Repair Information
[130(b)(vii)]

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Delay of Repair List

This is a list of those items currently on the Delay of Repair list (as of end of reporting period), placed there since February 28, 2006.

Component Number	Class	Description	Initial Inspection Date	Concentration (ppmv)	Date leaking > 10,000 ppmv	For valves leaking > 10,000 ppmv				Date placed on Delay of Repair	Placed on Delay of Repair by Unit Supervisor w/in 30 days?	Is LDAR monitoring continuing while on Delay of Repair	For pumps, were best efforts used to isolate and repair?
						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0116NSPSGV00073	VALVE	UNDERNEATH REACTOR 16-D2	12/07/2006	13,333	12/07/2006	Tighten packing	787	12/13/2006	TIMELY	12/21/2006	TIMELY	Yes	NA
						Previous repair	2,199	12/15/2006	TIMELY				
						Sealant	665	12/18/2006	TIMELY				
						Previous repair	6,944	12/20/2006	TIMELY				
						Previous repair	921	12/21/2006	TIMELY				
0116NSPSGV00079	VALVE	UNDER RECTOR 16-D1	03/18/2008	869	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	03/27/2008	TIMELY	Yes	NA
0116NSPSGV00148	VALVE	SW SIDE OF SEPARATOR 14F-1 25 FT UP BY COLUMN PS32	06/19/2008	8,853	06/24/2008	Steam packing	4,535	06/19/2008	TIMELY	07/03/2008	TIMELY	Yes	NA
						Tighten packing	12,900	06/24/2008	TIMELY				
						Previous repair	20,200	07/02/2008	TIMELY				
						Tighten packing	1,552	07/03/2008	TIMELY				
						Inject	59,000	07/03/2008	TIMELY				
0116NSPSGV00223	VALVE	OH COMPRESSOR, 14F-9B AT TOP LANDING	10/24/2007	15,100	10/24/2007	Tighten packing	27,000	10/24/2007	TIMELY	11/20/2007	TIMELY	Yes	NA
						Tighten packing	563	10/30/2007	TIMELY				
						Tighten packing	2,422	11/01/2007	TIMELY				
						Tighten packing	1,249	11/01/2007	TIMELY				
						Tighten packing	1,042	11/02/2007	TIMELY				
						Re-injection	3,008	11/05/2007	TIMELY				
						Re-injection	1,066	11/07/2007	TIMELY				
						close valve	1,219	11/09/2007	TIMELY				
0116NSPSGV00233	VALVE	OH COMPRESSOR 116GV-1 OFF 1ST LANDING	06/20/2008	2,712	06/24/2008	Tighten packing	2,643	06/20/2008	TIMELY	07/03/2008	TIMELY	Yes	NA
						Tighten packing	32,800	06/24/2008	TIMELY				
						Tighten packing	14,000	06/26/2008	TIMELY				
						Previous repair	9,095	07/02/2008	TIMELY				
						Previous repair	2,044	07/03/2008	TIMELY				
0116NSPSGV00269	VALVE	LANDING ABOVE AND E OF COMPRESSOR 16GB-1	06/03/2006	3,303	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	06/19/2006	TIMELY	Yes	NA
0116NSPSGV00318	VALVE	TOP OF D-4 TOWER HPB	09/21/2007	18,900	09/21/2007	Tighten flange	13,900	09/21/2007	TIMELY	10/05/2007	TIMELY	Yes	NA
						Tighten flange	12,600	09/26/2007	TIMELY				
						Tighten flange	1,105	09/28/2007	TIMELY				
						Tighten flange	804	10/01/2007	TIMELY				
						Tighten flange	3,144	10/02/2007	TIMELY				
						Leak source was upstream flange. Not injectable.							
0116NSPSGV00362	VALVE	TO S SIDE OF E-4 EXCHANGER, 2ND LANDING	09/22/2007	2,345	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/05/2007	TIMELY	Yes	NA
0116NSPSGV00502	VALVE	E SIDE OF TOWER 16F-1 AT 16FT-104	09/26/2007	4,765	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/05/2007	TIMELY	Yes	NA
0116NSPSGV00622	VALVE	W SIDE OF TOWER 16F-1 15 FT UP AT SG	03/28/2008	5,173	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	04/14/2008	TIMELY	Yes	NA

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						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0116NSPSGV00713	VALVE	155 FT HIGH 10 FT NW SIDE OF G-6 PUMP	09/17/2009	4,456	09/28/2009	Tighten packing	5,957	09/17/2009	TIMELY	09/29/2009	TIMELY	Yes	NA
						Tighten packing	2,072	09/21/2009	TIMELY				
						Tighten packing	2,503	02/22/2009	TIMELY				
						Applied sealant	1,858	09/25/2009	TIMELY				
						Applied sealant	593	09/25/2009	TIMELY				
						Applied sealant	588	09/28/2009	TIMELY				
						Steam	25,900	09/28/2009	TIMELY				
						Previous repair	1,473	10/05/2009	TIMELY				
0116NSPSGV00753	VALVE	E SIDE OF TOWER 16D-4 1ST LANDING AT SG	06/05/2006	14,194	06/14/2006	Tighten packing	2,530	06/05/2006	TIMELY	07/05/2006	TIMELY	Yes	NA
						Previous repair	2,679	06/06/2006	TIMELY				
						Previous repair	671	06/07/2006	TIMELY				
						Previous repair	1,232	06/08/2006	TIMELY				
						Previous repair	1,077	06/09/2006	TIMELY				
						Previous repair	1,129	06/12/2006	TIMELY				
						Previous repair	1,088	06/13/2006	TIMELY				
						Previous repair	16,300	06/14/2006	TIMELY				
						Tighten packing	2,094	06/15/2006	TIMELY				
						Previous repair	726	06/16/2006	TIMELY				
						Previous repair	19,200	06/19/2006	TIMELY				
						Re-inject	15,500	06/20/2006	TIMELY				
						Re-inject	13,900	06/20/2006	TIMELY				
						Previous repair	795	06/21/2006	TIMELY				
						Previous repair	1,154	06/22/2006	TIMELY				
						Previous repair	941	06/23/2006	TIMELY				
						Previous repair	1,061	06/26/2006	TIMELY				
						Previous repair	21,400	06/29/2006	TIMELY				
						Previous repair	16,700	06/30/2006	TIMELY				
						Previous repair	3,072	07/03/2006	TIMELY				
						Previous repair	910	07/05/2006	TIMELY				
						Previous repair	811	07/06/2006	TIMELY				
0116NSPSLL00013	VALVE	AT CTL 16FV-130 W SIDE OF FEED HEATER 116B-1	10/12/2006	2,015	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/25/2006	TIMELY	Yes	NA
0116NSPSLL00014	VALVE	AT CTL 16FV-130 W SIDE OF FEED HEATER 116B-1	10/12/2006	1,122	10/23/2006	Tighten packing	2,205	10/12/2006	TIMELY	10/27/2006	TIMELY	Yes	NA
						Previous repair	2,416	10/16/2006	TIMELY				
						Previous repair	506	10/18/2006	TIMELY				
						Inject	3,390	10/19/2006	TIMELY				
						Previous repair	646	10/20/2006	TIMELY				
						Previous repair	11,353	10/23/2006	TIMELY				
						Previous repair	3,722	10/24/2006	TIMELY				
						Steam seal	1,612	10/25/2006	TIMELY				
						Previous repair	9,987	10/26/2006	TIMELY				
						Previous repair	4,311	10/27/2006	TIMELY				

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						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0116NSPSLL00018	VALVE	AT CTL FV-130 W OF 116B-1 OH ORIFICE TAP	12/07/2006	13,800	12/07/2006	Steam seal	10,800	12/07/2006	TIMELY	12/21/2006	TIMELY	Yes	NA
						Tighten packing	3,189	12/15/2006	TIMELY				
						Steam packing	667	12/18/2006	TIMELY				
						Sealant	6,869	12/19/2006	TIMELY				
						Previous repair	2,944	12/20/2006	TIMELY				
						Previous repair	3,241	12/21/2006	TIMELY				
0116NSPSLL00113	VALVE	AT CTL FV-132 10FT HIGH W SIDE OF B-4 FURNACE	12/07/2006	23,400	12/07/2006	Steam seal	21,000	12/07/2006	TIMELY	12/21/2006	TIMELY	Yes	NA
						Tighten packing	525	12/15/2006	TIMELY				
						Steam packing	629	12/18/2006	TIMELY				
						Sealant	568	12/19/2006	TIMELY				
						Previous repair	1,295	12/20/2006	TIMELY				
						Previous repair	7,652	12/21/2006	TIMELY				
0116NSPSLL00140	VALVE	W SIDE OF E-3 1ST LANDING	11/20/2006	657	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	12/05/2006	TIMELY	Yes	NA
0116NSPSLL00144	VALVE	PUMP 16G-3B	07/11/2008	4,786	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	07/28/2008	TIMELY	Yes	NA
0116NSPSLL00170	VALVE	E SIDE OF D-4 TOWER 1ST LANDING	12/06/2006	888	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	12/21/2006	TIMELY	Yes	NA
0116NSPSLL00172	VALVE	E SIDE OF D-4 TOWER 1ST LANDING	12/06/2006	574	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	12/21/2006	TIMELY	Yes	NA
0116NSPSLL00270	VALVE	G-2B PUMP SPB	09/14/2006	1,463	09/27/2006	Tighten plug	2,147	09/14/2006	TIMELY	09/27/2006	TIMELY	Yes	NA
						Tighten packing	1,691	09/21/2006	TIMELY				
						Previous repair	4,502	09/25/2006	TIMELY				
						Previous repair	42,100	09/27/2006	TIMELY	09/27/2006	TIMELY	Yes	
						Leak source was the plug and could not be injected							
						Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/30/2007	TIMELY	Yes	NA
0118NSPSGV00076	VALVE	PLATFORM N OF FIN FAN 118E-4 OVER RAIL	08/15/2007	665	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/31/2007	TIMELY	Yes	NA
0118NSPSGV00218	VALVE	AT 118D-5 1ST LANDING OUTSIDE LADDER SW SIDE AT SG	08/17/2007	1,131	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/31/2007	TIMELY	Yes	NA
0118NSPSLL00041	VALVE	S OF PUMP 118G-2 UNDER W BATT LIMITS IN INST BOX FT-105	08/17/2007	1,020	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/31/2007	TIMELY	Yes	NA
0118NSPSLL00071	VALVE	ON CTL 118FV-103 S OF TOWER 118D-1	01/17/2007	5,194	01/17/2007	Steam seal (upstream flange)	21,200	01/17/2007	TIMELY	01/31/2007	TIMELY	Yes	NA
						Previous repair	4,120	01/19/2007	TIMELY				
						Apply sealant	851	01/23/2007	TIMELY				
						Apply sealant	1,053	01/26/2007	TIMELY				
						Previous repair	637	01/31/2007	TIMELY				
						Steam seal	23,100	11/13/2007	TIMELY	11/29/2007	TIMELY	Yes	NA
0118NSPSLL00124	VALVE	E OF PUMP 18G-58B N OF FIN FAN EF-53A	11/13/2007	804	11/13/2007	Previous repair	688	11/27/2007	TIMELY				
						Previous repair	3,279	11/28/2007	TIMELY				
						Previous repair	3,018	11/29/2007	TIMELY				
						Leak source was valve flange - not injectable.							
0118NSPSLL00406	VALVE	S SIDE OF PUMP 18G-10	02/08/2008	803	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	02/20/2008	TIMELY	Yes	NA
0118NSPSLL00458	VALVE	S SIDE OF PUMP 118G-12B	05/11/2007	524	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	05/25/2007	TIMELY	Yes	NA

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						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0118NSPSLL00488	VALVE	W BATT LIMITS BELOW PLAT NE SIDE ABOVE PUMP 118G-20	05/16/2008	1,172	05/20/2008	Steam packing	1,657	05/16/2008	TIMELY	05/30/2008	TIMELY	Yes	NA
						Tighten packing	26,300	05/20/2008	TIMELY				
						Tighten packing	14,900	05/22/2008	TIMELY				
						Inject	2,517	05/27/2008	TIMELY				
						Inject	8,372	05/28/2008	TIMELY				
01158NSPSLL00489	VALVE	W BATT LIMITS BELOW PLAT NE SIDE ABOVE PUMP 118G-20	05/16/2008	2,431	05/20/2008	Steam packing	3,108	05/16/2008	TIMELY	05/30/2008	TIMELY	Yes	NA
						Tighten packing	29,700	05/20/2008	TIMELY				
						Tighten packing	20,400	05/22/2008	TIMELY				
						Inject	1,908	05/27/2008	TIMELY				
						Inject	564	05/28/2008	TIMELY				
0118NSPSLL00547	VALVE	3RD LEVEL FROM TOP OF 118D-4 E SIDE	05/16/2007	8,326	05/24/2007	Previous repair	2,931	05/30/2008	TIMELY				
						Tighten packing	9,719	05/16/2007	TIMELY	05/31/2007	TIMELY	Yes	NA
						Tighten packing	868	05/21/2007	TIMELY				
						Tighten packing	20,500	05/24/2007	TIMELY				
						Previous repair	112,200	05/30/2007	TIMELY				
0118NSPSLL00593	VALVE	4TH LEVEL OF 118D-4 E SIDE	05/16/2007	2,831	05/30/2007	Previous repair	13,800	05/31/2007	TIMELY				
						Cast valve; follower and stud bent -- unsafe to be injected.							
						Tighten packing	1,640	05/16/2007	TIMELY	05/31/2007	TIMELY	Yes	NA
						Tighten packing	2,538	05/21/2007	TIMELY				
						Tighten packing	6,373	05/24/2007	TIMELY				
0119NSPSGV00080	VALVE	CTV PV-2400 NW SIDE OF F-21 C	02/26/2008	63,900	02/26/2008	Previous repair	18,100	05/30/2007	TIMELY				
						Inject	295	05/31/2007	TIMELY				
						Steam packing	69,100	02/26/2008	TIMELY	03/12/2008	TIMELY	Yes	NA
						Previous repair	42,000	03/06/2008	TIMELY				
						Previous repair	5,924	03/10/2008	TIMELY				
0120NSPSLL00540	VALVE	SE SIDE OF 120E-511B INLINE BLOCK V	3/3/2011	24,600	3/3/2011	Tighten packing	5,185	03/12/2008	TIMELY				
						Control valve - can not inject							
						Steam packing	5,004	3/3/2011	TIMELY	3/15/2011	TIMELY	Yes	NA
						Tighten packing	4,227	3/3/2011	TIMELY				
						Tightened	706	6/27/2011	Not > 10,000	7/8/2011	TIMELY	Yes	NA
0120NSPSLL00834	VALVE	CONTROL LOOP 120TV-5629 AT 120E-526 LOW POINT BLEEDER	6/23/11	1,560		Tightened	816	6/29/2011					
						Tightened	8438	08/22/2011	NA	08/30/2011	TIMELY	Yes	NA
						Tightened	25000	08/24/2011	NA				
						This is a knife that can not be injected.							
						Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	09/01/2008	TIMELY	Yes	NA
0122HONGV00195	VALVE	S END OF 122EH-13	08/22/2006	2,846	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	01/29/2008	TIMELY	Yes	NA
0122HON GV00216	VALVE	CTL N SIDE OF 122FH-7 BYPASS	01/18/2008	807	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/26/2007	TIMELY	Yes	NA
0122HONGV00254	VALVE	AT CTL 122PV-419 W OF 122FH-9	10/11/2007	607	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	07/16/2008	TIMELY	Yes	NA
0122HONGV00262	VALVE	AT CTL 122PV-419 W OF 122FH-9	07/07/2008	857	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000				

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0122HONGV00293	CONNECT	AT 122EH-10 FLNG	01/12/2006	24,083	NA	► Placed on DOR before February 28, 2006							
0122HONGV00394	VALVE	TOP OF 122DH-1B OVER N. RAIL	07/20/2007	616	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/03/2007	TIMELY	Yes	NA
0122HONGV00395	VALVE	TOP OF 122DH-1B	10/11/2007	16,100	10/25/2007	Tighten packing	5,820	10/11/2007	TIMELY	10/26/2007	TIMELY	Yes	NA
						Tighten packing	2,825	10/16/2007	TIMELY				
						Tighten packing	1,064	10/18/2007	TIMELY				
						Sealant	9,396	10/22/2007	TIMELY				
						Inject	14,700	10/25/2007	TIMELY				
0122HONGV00721	VALVE	SW SIDE OF 122EU-25 LANDING 3	05/19/2008	657	na	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	06/03/2008	TIMELY	Yes	NA
0122HONGV00738	VALVE	CTV 122LV-2766 ON W SIDE OF 122DU-2 AT 3RD LANDING	06/19/2006	2,101	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	06/27/2006	TIMELY	Yes	NA
0122HONGV00832	VALVE	E SIDE OF 122EH-4 TOP OF SG	07/24/2008	5,457	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	11/02/2006	TIMELY	Yes	NA
0122HONGV00833	VALVE	E SIDE OF 122EH-4 TOP OF SG	10/18/2006	611	10/26/2006	Steam packing	621	10/18/2006	TIMELY	11/02/2006	TIMELY	Yes	NA
						Previous repair	2,033	10/20/2006	TIMELY				
						Previous repair	1,988	10/23/2006	TIMELY				
						Previous repair	1,824	10/24/2006	TIMELY				
						Tighten packing	1,301	10/25/2006	TIMELY				
						Previous repair	32,000	10/26/2006	TIMELY				
						Tighten packing	688	10/27/2006	TIMELY				
						Previous repair	15,900		TIMELY				
						Previous repair	1,336	10/30/2006	TIMELY				
						Inject	846	11/01/2006	TIMELY				
						Previous repair	2,883	11/02/2006	TIMELY				
0122HONLL00042	PUMP	122GC-4A PUMP	08/20/2012	39,400	08/20/2012	Steamed Packing	14,700	08/20/2012	TIMELY	08/30/2012	TIMELY	Yes	Yes
0122HONLL00055	PUMP	122GH-8A PUMP	06/10/2010	2,878	NA	Not a Valve	Not a Valve	Not a Valve	Not a Valve	06/25/2010	TIMELY	Yes	Yes
0122HONLL00805	VALVE	BETWEEN 3RD AND 4TH LANDING OF 122DH-1	08/31/2006	31,800	08/31/2006	Tighten packing	2,761	09/01/2006	TIMELY	09/14/2006	TIMELY	Yes	NA
						Previous repair	9,373	09/05/2006	TIMELY				
						Tighten packing	15,000	09/12/2006	TIMELY				
						Previous repair	808	09/13/2006	TIMELY				
0122HONLL00958	CONNECT	E SIDE OF EH-1 ON CTL 22FV-201 (SCREWED FITTING)	09/30/2008	72,000	09/30/2008	Not a Valve	Not a Valve	Not a Valve	Not a Valve	10/13/2008	TIMELY	Yes	NA
0122HONLL00960	VALVE	CTL 122FRC-201 E SIDE OF 122EH-1	05/10/2008	545	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	05/23/2008	TIMELY	Yes	NA
0122HONLL00975	VALVE	BY CTL 122FV-223 W OF 122DH-E CHK	06/10/2009	895	06/13/2009	Steam	1,453	06/10/2009	TIMELY	06/19/2009	TIMELY	Yes	NA
						Tightened	988	06/12/2009					
						Applied sealant	14,900	06/13/2009					
						Previous repair	30,500	06/17/2009					
						Leak source is a screwed fitting that cannot be injected.							
0122HONLL01021	VALVE	BY 122LV-805 W OF 122EH-3 LPB	07/10/2007	58,500	07/10/2007	Steam packing	17,500	07/10/2007	TIMELY	07/25/2007	TIMELY	Yes	NA
						Tighten packing	6,763	07/13/2007	TIMELY				
						Steam packing	3,537	07/19/2007	TIMELY				
						Tighten packing	1,261	07/20/2007	TIMELY				
						Previous repair	15,400	07/25/2007	TIMELY				
						Valve had previously been injected.							

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						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0122HONLL01062	VALVE	S OF 122GH-4A OH ORIFICE TAP	09/17/2007	1,187	09/25/2007	Steam packing	1,262	09/17/2007	TIMELY	09/27/2007	TIMELY	Yes	NA
						Re-inject	1,878	09/22/2007	TIMELY		TIMELY	Yes	
						Tighten packing	69,000	09/25/2007	TIMELY		TIMELY	Yes	
						Valve had previously been injected.					TIMELY	Yes	
0122HONLL01112	VALVE	PUMP 122GH-4A	10/03/2006	15,398	10/03/2006	Inject	2,204	10/07/2006	TIMELY	10/18/2006	TIMELY	Yes	NA
						Sealant	3,625	10/09/2006	TIMELY				
						Previous repair	2,165	10/10/2006	TIMELY				
						Sealant	573	10/10/2006	TIMELY				
						Previous repair	844	10/11/2006	TIMELY				
						Previous repair	2,186	10/13/2006	TIMELY				
						Tighten fitting	748	10/16/2006	TIMELY				
						Re-inject	3,451	10/17/2006	TIMELY				
0122HONLL01146	VALVE	BETWEEN 3RD AND 4TH LANDING AT 122DH-3	01/29/2008	629	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	02/13/2008	TIMELY	Yes	NA
0122HONLL01148	VALVE	AT 122DH-3 3RD LANDING OUTSIDE LADDER	08/31/2006	7,434	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	09/14/2006	TIMELY	Yes	NA
0122HONLL01152	VALVE	1ST LANDING OF 122DH-3 BLOCK VALVE FOR STEAMOUT LINE	07/07/2008	615	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	07/16/2008	TIMELY	Yes	NA
0122HONLL01158	VALVE	W SIDE OF 122DH-3 ABOVE SG	08/19/2006	785	08/23/2006	Tighten	530	08/19/2006	TIMELY	09/01/2006	TIMELY	Yes	NA
						Previous repair	840	08/21/2006	TIMELY				
						Previous repair	629	08/22/2006	TIMELY				
						Previous repair	10,600	08/23/2006	TIMELY				
						Tighten	541	08/30/2006	TIMELY				
						Previous repair	665	09/01/2006	TIMELY				
						Previous repair	621	09/05/2006					
						Previous repair	576	09/06/2006					
0122HONLL01192	VALVE	AT 122EH-6 SG	06/18/2008	2,409	06/18/2008	Previous repair	650	09/07/2006					
						Tighten packing	21,800	06/18/2008	TIMELY	07/02/2008	TIMELY	Yes	NA
						Sealant	157,000	06/20/2008	TIMELY				
						Previous repair	5,869	07/02/2008	TIMELY				
0122HONLL01398	VALVE	N SIDE OF 122EH-15 ON PS BETWEEN 122GH-8A AND 122GH-4	08/21/2012	10,400	08/21/2012	Previous repair	80,400	07/02/2008	TIMELY				
						Leak source is screwed injector fitting from prior injection. Cannot be injected.							
						Steamed	19,100	08/21/2012	TIMELY	09/05/2012	TIMELY	Yes	NA
						Component is a nut valve and could not be injected.							
0122HONLL01562	VALVE	E OF 122GH-6A	01/30/2008	64,100	01/30/2008	Tighten plug	1,786	01/30/2008	TIMELY	02/13/2008	TIMELY	Yes	NA
						Applied sealant	68,900	02/07/2008	TIMELY				
						Tighten plug	7,454	02/11/2008	TIMELY				
						Leak source is plug. Cannot be injected.							
0122HONLL01568	VALVE	AT CTL FV-210 E OF 122GH-6A LPB	05/13/2008	180,100	05/13/2008	Tighten plug	208,300	05/13/2008	TIMELY	05/28/2008	TIMELY	Yes	NA
						Replaced plug	546	05/16/2008	TIMELY				
						Tighten plug	100,000	05/20/2008	TIMELY				
						Leak source is plug. Cannot be injected							
0122HONLL01596	VALVE	AT PUMP 122GH-3A	06/06/2007	523	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	06/19/2007	TIMELY	Yes	NA

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Delay of Repair Information
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Lemont Refinery
CITGO Petroleum Corporation
Semi-Annual Report
July 1, 2012 to December 31, 2012

Delay of Repair List

This is a list of those items currently on the Delay of Repair list (as of end of reporting period), placed there since February 28, 2006.

Component Number	Class	Description	Initial Inspection Date	Concentration (ppmv)	Date leaking > 10,000 ppmv	For valves leaking > 10,000 ppmv				Date placed on Delay of Repair	Placed on Delay of Repair by Unit Supervisor w/in 30 days?	Is LDAR monitoring continuing while on Delay of Repair	For pumps, were best efforts used to isolate and repair?
						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0122HONLL01699	VALVE	PUMP 122GU-19B	04/01/2008	2,008	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	04/16/2008	TIMELY	Yes	NA
0122HONLL01750	CONNECT	CENTER OF TKA-1 ON TOP FLNG	04/07/2009	100,000	04/07/2009	Not a Valve	Not a Valve	Not a Valve	Not a Valve	04/22/2009	TIMELY	Yes	NA
0122HONLL01886	VALVE	NE SIDE OF 122TKA-4	08/24/2006	9,800	08/24/2006	Tighten flange	10,300	08/24/2006	TIMELY	09/06/2006	TIMELY	Yes	NA
						Sealant	4,911	08/31/2006	TIMELY				
						Previous repair	4,921	09/05/2006	TIMELY				
						Previous repair	14,100	09/06/2006	TIMELY				
						Leak source was the flange of the valve							
0122HONLL02170	CONNECT	W SIDE OF DU-1 TOWER 2ND LANDING FROM EU-1	10/28/2008	17,000	10/28/2008	Not a Valve	Not a Valve	Not a Valve	Not a Valve	11/12/2008	TIMELY	Yes	NA
0122HONLL02268	VALVE	E SIDE OF 122EU-2a EXCHANGER 7 FT OH	07/21/2008	3,362	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/01/2008	TIMELY	Yes	NA
0122HONLL02306	CONNECT	N SIDE OF EU-2 EXCHANGER HEADER BOX	04/29/2009	3,915	NA	Not a Valve	Not a Valve	Not a Valve	Not a Valve	05/14/2009	TIMELY	Yes	NA
0122HONLL02309	CONNECT	N SIDE OF EU-2 EXCHANGER HEADER BOX	04/19/2007	1,011	NA	Not a Valve	Not a Valve	Not a Valve	Not a Valve	05/04/2007	TIMELY	Yes	NA
0122HONLL02497	CONNECT	N SIDE OF BTMS COOLER AND EP-12 TOP LANDING UNION	07/15/2009	17,200	NA	Not a Valve	Not a Valve	Not a Valve	Not a Valve	07/30/2009	TIMELY	Yes	NA
0122HONLL02799	VALVE	AT CTL 122PV-2396 W SIDE OF 122EU-16	10/09/2006	590	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/24/2006	TIMELY	Yes	NA
0122HONLL02901	VALVE	ON CTL PV-384 TOP OF FH-10	04/11/2008	8,244	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	04/25/2008	TIMELY	Yes	NA
0122HONLL02904	VALVE	AT CTL 122PV-384 TOP OF 122FH-10	08/21/2006	16,700	08/21/2006	Tighten flange	3,342	08/21/2006	TIMELY	09/01/2006	TIMELY	Yes	NA
						Previous repair	3,800	08/22/2006	TIMELY				
						Previous repair	20,000	08/23/2006	TIMELY				
						Previous repair	2,265	09/01/2006	TIMELY				
						Previous repair	25,000	09/05/2006					
						Previous repair	4,012	09/06/2006					
						Previous repair	7,742	09/07/2006					
0122HONLL03117	VALVE	5 FT S OF 122GP-5A PUMP 20FT OH ORIFICE TAPS	04/28/2008	772	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	05/13/2008	TIMELY	Yes	NA
0122HONLL03451	VALVE	W SIDE OF 122DU-22 10FT OH	12/05/2006	785	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	12/20/2006	TIMELY	Yes	NA
0122HONLL03471	VALVE	W OF 122DU-22 N SIDE OF CTL 122FV-149	07/18/2006	1,127	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/02/2006	TIMELY	Yes	NA
0122HONLL03480	VALVE	S SIDE OF CTL 122LV-149 W OF 122DU-22	07/11/2007	748	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	07/25/2007	TIMELY	Yes	NA
0122HONLL03485	VALVE	W SIDE OF DU-22 N SIDE OF BOX	04/04/2008	812	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	04/21/2008	TIMELY	Yes	NA
0122HONLL04316	VALVE	BELOW E SIDE OF EU-24 ORIFICE TAP OF FT 2263	04/29/2008	19,400	04/29/2008	Tighten packing	1,553	04/29/2008	TIMELY	05/13/2008	TIMELY	Yes	NA
						Tighten packing	1,860	05/05/2008	TIMELY				
						Applied sealant	1,930	05/07/2008	TIMELY				

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0122NSPSGV00380	VALVE	ON CTL 122PRC-2308A N OF 122EU-2	10/10/2006	2,198	09/26/2006	Steam packing	100,000	09/26/2006	TIMELY	10/11/2006	TIMELY	Yes	NA
						Previous repair	1,595	09/28/2006	TIMELY				
						Previous repair	1,001	09/29/2006	TIMELY				
						Previous repair	1,001	10/02/2006	TIMELY				
						Previous repair	782	10/03/2006	TIMELY				
						Previous repair	1,203	10/04/2006	TIMELY				
						Previous repair	993	10/05/2006	TIMELY				
						Previous repair	1,506	10/06/2006	TIMELY				
						Previous repair	2,415	10/09/2006	TIMELY				
						Previous repair	740	10/10/2006	TIMELY				
						Steam packing	30,100	07/19/2006	TIMELY	08/03/2006	TIMELY	Yes	NA
						Previous repair	2,608	07/20/2006	TIMELY				
0122NSPSLL00117	VALVE	W SIDE OF 122EP-2	07/19/2006	29,400	07/19/2006	Previous repair	10,700	07/21/2006	TIMELY				
						Previous repair	5,200	07/24/2006	TIMELY				
						Previous repair	2,106	07/25/2006	TIMELY				
						Previous repair	11,700	08/01/2006	TIMELY				
						Previous repair	9,806	08/02/2006	TIMELY				
						Previous repair	11,800	08/03/2006	TIMELY				
						Leak source in the injector itself							
						Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	11/25/2009	TIMELY	Yes	NA
						Not a Valve	Not a Valve	Not a Valve	Not a Valve	03/15/2012	TIMELY	Yes	Yes
						Not a Valve	Not a Valve	Not a Valve	Not a Valve	03/09/2010	TIMELY	Yes	NA
						Not a Valve	Not a Valve	Not a Valve	Not a Valve	03/09/2010	TIMELY	Yes	NA
						Not a Valve	Not a Valve	Not a Valve	Not a Valve	03/09/2010	TIMELY	Yes	NA
0123CR1GV00279	VALVE	NE SIDE OF B-2 3RD LEVEL	11/10/2009	2,034	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	11/25/2009	TIMELY	Yes	NA
0123NSPSLL00010	PUMP	123GJ-5 SEAL OF PUMP FRACT REFLUX & TRANSFER	03/01/2020	100,000	NA	Not a Valve	Not a Valve	Not a Valve	Not a Valve	03/15/2012	TIMELY	Yes	Yes
AVO-0131	CONNECT	TOP OF 123DD-1 TOWER 10IN FLANGE CONNECTION OF LINE TO EXCHANGER 123ED-2A/B SHELL	02/22/2010	99,996	02/23/2012	Not a Valve	Not a Valve	Not a Valve	Not a Valve	03/09/2010	TIMELY	Yes	NA
0125NSPSGV00114	VALVE	BOTTOM OF B-2 BURNER 11 HPB	02/05/2009	1,670	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	02/20/2009	TIMELY	Yes	NA
0125NSPSGV00218	VALVE	W END OF BATT LIMITS 1ST LANDING	08/24/2007	2,527	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	09/08/2007	TIMELY	Yes	NA
0125NSPSGV00317	VALVE	BETWEEN 25B-1 AND 25D-1 BETWEEN PS41 AND PS40 CHK	05/27/2009	10,500	05/27/2009	Steamed	38,500	05/27/2009	TIMELY	06/11/2009	TIMELY	Yes	NA
						Tightened	5,000	05/29/2009	TIMELY				
						Tightened	27,700	06/11/2009	TIMELY				
						Valve is a check valve. Check valves cannot be injected.							
0125NSPSGV00535	VALVE	WEST SIDE OF COMPRESSOR 125GB-5 ON LANDING	07/14/2008	41,000	07/14/2008	Steamed	no remonitor that day	07/14/2008	TIMELY	07/28/2008	TIMELY	Yes	NA
						Applied sealant	13000	07/16/2008	TIMELY				
						Previous repair	100000	07/19/2008	TIMELY				
						Applied sealant	100000	07/22/2008	TIMELY				
						Leak source was a screwed fitting (union) on valve. Not injectable.							
110806	VALVE	102 W SIDE BATTERY LIITS BY PS02 OH BOTTOM ROW	03/24/2008	5,981	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	04/08/2008	TIMELY	Yes	NA
110817	VALVE	102 W SIDE BATTERY LIMITS BY PS02 OH BOTTOM LEVEL HPB	04/23/2009	766	na	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	05/06/2009	TIMELY	Yes	NA

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						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
15586	VALVE	W SIDE OF TK 432 IN PIPEROW E OF 331G-9A OH CHAIN OPERATED	07/30/2009	100,000	07/30/2009	Tightened packing	100000	07/30/2009	TIMELY	08/14/2009	TIMELY	Yes	NA
						Tightened packing	35000	08/03/2009	TIMELY				
						Injected	100000	08/06/2009	TIMELY				
						Steam	8497	08/07/2009	TIMELY				
						Injected	15000	08/10/2009	TIMELY				
						Injected	1750	08/12/2009	TIMELY				
						Previous repair	3154	08/13/2009	TIMELY				
						Previous repair	992	08/14/2009	TIMELY				
16523	VALVE	SE OF 334 LOADING RACK OH DTM BY PS22	09/14/2009	28,200	09/14/2009	Tightened packing	38700	09/14/2009	TIMELY	09/29/2009	TIMELY	Yes	NA
						Tightened packing	1285	09/16/2009	TIMELY				
						Tightened packing	3583	09/23/2009	TIMELY				
0212NSPSGV00351	Valve	N SIDE OF 212GB-301 2ND LANDING HIGH POINT BLEEDER	06/23/2011	48,500	06/23/2011	Tightened Packing	71500	4/26/2011	Damaged Follow	5/11/2011	TIMELY	Yes	NA
						Steam	34,000	06/23/2011	Not injectable	07/07/2011	TIMELY	Yes	NA
						Applied sealant	12,700	06/27/2011					
						Tightened	32,700	07/01/2011					
						Tightened	13,200	07/05/2011					
						Applied sealant	11,300	07/06/2011					
						Leak source was the plug of the valve. Not injectable.							
						No injection - damaged gland flange				09/28/2012	TIMELY	Yes	NA
15851	Valve	20FT W OF 212G-8A OVERHEAD	06/22/2011	11,900	06/22/2011	Tightened	18,800	06/22/2011	Not injectable	07/07/2011	TIMELY	Yes	NA
						Applied sealant	100,000	06/24/2011					
						Applied sealant	100,000	07/01/2011					
						Tightened	100,000	07/05/2011					
						Applied sealant	79,700	07/06/2011					
						Valve is a orifice tap (HEX). Not injectable.							
						Tighten plug	56,900	07/12/2007	TIMELY				
						Replace plug	22,000	07/16/2007	TIMELY				
						Previous repair	55,200	07/25/2007	TIMELY				
						Leak source was plug on valve - not injectable.							
0217NSPSGV00772	VALVE	217D-7 DOWNSTREAM BLOCK OF 217LT-728 SE SIDE	08/02/2012	3,346	08/02/2012	No injection - Leak source is body/bonnet interface				08/13/2012	TIMELY	Yes	NA
0217NSPSLL00491	VALVE	217XV-1920 TOP E SIDE OF 217D-401A ON PROPANE SKID	09/28/2011	29,200	09/28/2011	Steam	790	09/28/2011	NA	10/11/2011	TIMELY	Yes	NA
						Tightened	1476	09/29/2011					
						Tightened	100,000	09/30/2011					
						Previous repair	12,100	10/03/2011					
						Tightened	26,000	10/04/2011					
0228NSPSLL00066	VALVE	E SIDE OF PUMP 228G-2 FCC BLENDING BLOCK FOR FILTER	02/13/2007	787	NA	► Switch valve - can not inject							
						Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	02/28/2007	TIMELY	Yes	NA

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0228NSPSLL00097	VALVE	NW OF 28G-2 AT SE SIDE OF PIPE RACK CROSSOVER W OF PS-134S	07/27/2004	1,561	NA	► Placed on DOR before February 28, 2006							
0228NSPSLL00115	VALVE	1FT W OF PUMP 28G-4	09/22/2006	5,004	09/22/2006	Tighten	17,900	09/22/2006	TIMELY	10/07/2006	TIMELY	Yes	NA
						Previous repair	2,605	09/27/2006	TIMELY				
						Previous repair	4,275	09/28/2006	TIMELY				
						Previous repair	10,500	09/29/2006	TIMELY				
						Previous repair	2,637	10/02/2006	TIMELY				
						Tighten packing	2,343	10/03/2006	TIMELY				
						Tighten packing	783	10/04/2006	TIMELY				
						Inject	1,617	10/05/2006	TIMELY				
						Previous repair	13,200	10/06/2006	TIMELY				
						Previous repair	1,320	10/07/2006	TIMELY				
0228NSPSLL00414	VALVE	CTV PCV-304 N SIDE OF BLDG 49	11/26/2004	935	NA	► Placed on DOR before February 28, 2006							
0228NSPSLL00437	VALVE	5FT E OF PS-143 1ST LANDING	11/05/2008	1,140	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	11/20/2008	TIMELY	Yes	NA
0228NSPSLL00639	VALVE	20 FT NW OF PUMP G-2	08/07/2007	584	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/22/2007	TIMELY	Yes	NA
0228NSPSLL00700	VALVE	N SIDE OF G-66 CHK	09/22/2006	816,300	09/22/2006	Tighten plug	31,000	09/22/2006	TIMELY	10/07/2006	TIMELY	Yes	NA
						Sealant	2,441	09/26/2006	TIMELY				
						Sealant	28,400	09/27/2006	TIMELY				
						Sealant	9,852	09/28/2006	TIMELY				
						Previous repair	1,090	09/29/2006	TIMELY				
						Previous repair	815	10/02/2006	TIMELY				
						Tightened packing and applied sealant	6,381	10/03/2006	TIMELY				
						Previous repair	1,026	10/04/2006	TIMELY				
						Previous repair	728	10/05/2006	TIMELY				
						Previous repair	850	10/06/2006	TIMELY				
						Tightened plug and applied sealant	2,914	10/07/2006	TIMELY				
						Sealant	584	10/09/2006	TIMELY				
						Tighten packing	57,510,000	02/15/2008	TIMELY	02/29/2008	TIMELY	Yes	NA
0228NSPSLL00754	VALVE	MOV-265 N SIDE OF G-56	02/15/2008	4,598	02/15/2008	Previous repair	7,886	02/27/2008	TIMELY				
						Tighten packing	548	02/27/2008	TIMELY				
						Previous repair	613	02/28/2008	TIMELY				
						Previous repair	504	02/29/2008	TIMELY				

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0228NSPSLL00842	VALVE	IN SATELLITE E SIDE OF A-901	08/10/2006	4,275	08/22/2006	Tighten	998	08/10/2006	TIMELY	09/09/2006	TIMELY	Yes	NA
						Previous repair	727	08/11/2006	TIMELY				
						Previous repair	730	08/14/2006	TIMELY				
						Previous repair	2,697	08/15/2006	TIMELY				
						Previous repair	2,061	08/16/2006	TIMELY				
						Previous repair	5,112	08/17/2006	TIMELY				
						Previous repair	4,640	08/18/2006	TIMELY				
						Previous repair	678	08/21/2006	TIMELY				
						Previous repair	16,900	08/22/2006	TIMELY				
						Previous repair	3,877	08/23/2006	TIMELY				
						Sealant	7,287	08/24/2006	TIMELY				
						Tighten packing	3,765	08/25/2006	TIMELY				
						Tighten	2,134	09/22/2006	TIMELY				
0228NSPSLL00928	VALVE	NW OF PUMP G-2 ON LAND AT PS-132 N RAIL	11/06/2006	787	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	09/01/2006	TIMELY	Yes	NA
0331HONLL00217	VALVE	SW OF TANK 501 AT CORNER OF ROAD SLOP HEADER	07/28/2006	1,011	08/04/2006	Tighten	2,351	07/28/2006	TIMELY	08/11/2006	TIMELY	Yes	NA
						Previous repair	956	08/01/2006	TIMELY				
						Previous repair	1,924	08/02/2006	TIMELY				
						Previous repair	33,200	08/04/2006	TIMELY				
						Inject	796	08/07/2006	TIMELY				
						Previous repair	7,555	08/08/2006	TIMELY				
						Previous repair	3,001	08/09/2006	TIMELY				
						Previous repair	3,565	08/10/2006	TIMELY				
						Previous repair	1,808	08/11/2006	TIMELY				
0331HONLL00250	VALVE	SW OF TANK 501 AT CORNER OF THE ROAD VALVE IS BOXED ON TEXTILE SPIRIT LINE	10/05/2012	86,600	10/05/2012	Re-Injected	100,000	10/08/2012	TIMELY	10/18/2012	TIMELY	Yes	NA
0331HONLL00538	VALVE	S OF PUMP 18G--115	11/02/2010	100,000	11/02/2010	Steam	100,000	11/02/2010	TIMELY	11/17/2010	TIMELY	Yes	NA
						Sealant	1,034	11/03/2010	TIMELY				
						Sealant	1,481	11/09/2010	TIMELY				
0331HONLL00633	VALVE	MOV-1907-2 E OF SOLVENT RACK PUMP 18G-104	01/14/2008	585	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	01/29/2008	TIMELY	Yes	NA
0331HONLL00690	VALVE	S OF PUMP 18G-115 IN PIPE RACK	08/23/2006	10,100	08/23/2006	Tighten packing	11,000	08/23/2006	TIMELY	09/07/2006	TIMELY	Yes	NA
						Tighten packing	3,389	09/06/2006	TIMELY				
						Inject	4,400	09/07/2006	TIMELY				
0331HONLL00708	VALVE	S SIDE OF 18G-111 SW OF TANK 617 ON PAD	07/27/2006	1,584	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/11/2006	TIMELY	Yes	NA
0331HONLL01025	VALVE	IN GPR ACROSS ROAD W OF TANK 601 E OF SOLVENT RACK	07/27/2006	3,387	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/11/2006	TIMELY	Yes	NA
0331HONLL01035	VALVE	IN GPR ACROSS ROAD W OF TANK 601 E OF SOLVENT RACK	07/27/2006	1,210	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/11/2006	TIMELY	Yes	NA

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0331NSPSGV00113	VALVE	N PMP 31G-10	10/06/2006	6,848	10/06/2006	Tighten	15,500	10/06/2006	TIMELY	10/21/2006	TIMELY	Yes	NA
						Tightened packing and applied sealant	1,516	10/10/2006	TIMELY				
						Tighten packing	719	10/16/2006	TIMELY				
						Inject	680	10/17/2006	TIMELY				
						Re-Inject	1,924	10/19/2006	TIMELY				
						Previous repair	2,572	10/20/2006	TIMELY				
0331NSPSLL00349	VALVE	NW SIDE TANK 407	10/19/2006	715	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	11/06/2006	TIMELY	Yes	NA
0331NSPSLL00364	VALVE	TANK 405 SW SIDE MOV-1231	04/24/2007	623	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	05/11/2007	TIMELY	Yes	NA
0331NSPSLL00870	RELIEF	PRV 31SV-488 TANK 302 N SIDE	01/18/2007	5,281	01/18/2007	Not a Valve	Not a Valve	Not a Valve	Not a Valve	02/02/2007	TIMELY	Yes	NA
0331NSPSLL00876	VALVE	ON N SIDE OF TK-208	08/25/2006	10,000	08/25/2006	Tighten	11,500	08/25/2006	TIMELY	09/09/2006	TIMELY	Yes	NA
						Previous repair	3,859	09/09/2006	TIMELY				
0331NSPSLL00892	VALVE	SE END OF PLATFORM N OF BUTANE SPHERE 68	01/09/2008	5,619	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	01/24/2008	TIMELY	Yes	NA
0331NSPSLL00983	VALVE	PUMP PAD SW OF TANK 429 PUMP 35G-3	09/20/2006	2,291	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/05/2006	TIMELY	Yes	NA
0331NSPSLL01001	VALVE	N SIDE OF TANK 402	10/09/2006	525	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/24/2006	TIMELY	Yes	NA
0331NSPSLL01008	RELIEF	PRV 128SV-944 W SIDE OF PUMP 128G-21A NE OF PROPANE BULLETS	08/25/2006	13,800	08/25/2006	Not a Valve	Not a Valve	Not a Valve	Not a Valve	09/09/2006	TIMELY	Yes	NA
0331NSPSLL01012	VALVE	NE OF PUMP 128G-21A NE OF PROPANE BULLETS	10/05/2006	9,285	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/20/2006	TIMELY	Yes	NA
0331NSPSLL01019	VALVE	W OF PUMP 128G-21B NE OF PROPANE BULLETS	12/08/2003	540	NA	► Placed on DOR before February 28, 2006							
0331NSPSLL01032	VALVE	W OF PUMP 128G-21B GPR NE OF PROPANE BULLETS	09/21/2006	2,577	10/02/2006	Steam seal	2,753	09/21/2006	TIMELY	10/06/2006	TIMELY	Yes	NA
						Previous repair	4,706	09/25/2006	TIMELY				
						Previous repair	4,840	09/27/2006	TIMELY				
						Previous repair	2,067	09/28/2006	TIMELY				
						Previous repair	868	09/29/2006	TIMELY				
						Previous repair	14,100	10/02/2006	TIMELY				
						Sealant	19,700	10/03/2006	TIMELY				
						Previous repair	11,200	10/04/2006	TIMELY				
						Previous repair	1,259	10/05/2006	TIMELY				
						Previous repair	10,900	10/06/2006	TIMELY				
						Ball valve can not inject							
0331NSPSLL01058	VALVE	NW OF PUMP 128G-21B NE OF PROPANE BULLETS	07/24/2006	1,775	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/08/2006	TIMELY	Yes	NA

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						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0331NSPSLL01087	VALVE	E SIDE PMP 31G-10 PIPE ROW	07/25/2006	13,500	07/25/2006	Tighten flange (valve injected twice previously)	11,900	07/25/2006	TIMELY	08/09/2006	TIMELY	Yes	NA
						Tighten flange	2,059	07/25/2006	TIMELY				
						Previous repair	72,700	07/27/2006	TIMELY				
						Previous repair	90,700	08/01/2006	TIMELY				
						Previous repair	6,281	08/02/2006	TIMELY				
						Tighten flange	5,359	08/04/2006	TIMELY				
						Tighten packing	9,409	08/07/2006	TIMELY				
						Previous repair	6,093	08/08/2006	TIMELY				
						Previous repair	10,100	08/09/2006	TIMELY				
0331NSPSLL01093	VALVE	IN PIPE ROW NE PMP 31G-5	10/05/2006	3,536	10/20/2006	Tighten flange	7,201	10/05/2006	TIMELY	10/20/2006	TIMELY	Yes	NA
						Tighten packing	964	10/12/2006	TIMELY				
						Tighten flange	1,422	10/17/2006	TIMELY				
						Previous repair	67,100	10/20/2006	TIMELY				
						Previous repair	3,476	10/23/2006	TIMELY				
0331NSPSLL01096	VALVE	NE OF PUMP G-5 IN PIPE ROW E OF PROPANE BULLETS	07/31/2006	2,088	08/08/2006	Tighten flange	2,935	07/31/2006	TIMELY	08/15/2006	TIMELY	Yes	NA
						Previous repair	2,090	08/01/2006	TIMELY				
						Previous repair	7,190	08/02/2006	TIMELY				
						Previous repair	5,784	08/04/2006	TIMELY				
						Tighten packing	9,400	08/07/2006	TIMELY				
						Previous repair	41,100	08/08/2006	TIMELY				
						Previous repair	6,285	08/09/2006	TIMELY				
						Previous repair	16,000	08/10/2006	TIMELY				
						Previous repair	3,347	08/11/2006	TIMELY				
						Previous repair	34,700	08/14/2006	TIMELY				
						Previous repair	3,544	08/15/2006	TIMELY				
						Sealant	13,700	08/16/2006	TIMELY				
						Previous repair	109,900	08/17/2006	TIMELY				
						Leak source was the valve flange							
0331NSPSLL01126	VALVE	CTV PCV-319. BUTANE SPHERES SE OF SPHERE 66	10/22/2007	7,790	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	11/13/2007	TIMELY	Yes	NA
0331NSPSLL01136	RELIEF	PRV 131SV-2902 CTL NE OF BUTANE SPHERE 65	06/29/2006	97,100	06/29/2006	Not a Valve	Not a Valve	Not a Valve	Not a Valve	07/14/2006	TIMELY	Yes	NA
0331NSPSLL01137	VALVE	BUTANE SPHERES CONTROL LOOP NE OF BUTANE SPHERE 65	12/09/2003	5,343	NA	► Placed on DOR before February 28, 2006							
0331NSPSLL01149	VALVE	BUTANE SPHERES E SIDE OF SPHERE 67	07/26/2007	1,575	07/26/2007	Tighten packing	10,300	07/26/2007	TIMELY	08/10/2007	TIMELY	Yes	NA
						Previous repair	893	08/07/2007	TIMELY				
						Previous repair	527	08/10/2007	TIMELY				
0331NSPSLL01203	VALVE	N OF TANK 437	08/26/2006	4,329	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	09/09/2006	TIMELY	Yes	NA
0331NSPSLL01304	VALVE	ON CTL S OF PIPE ROW E OF 90	12/09/2003	841	NA	► Placed on DOR before February 28, 2006							

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Component Number	Class	Description	Initial Inspection Date	Concentration (ppmv)	Date leaking > 10,000 ppmv	For valves leaking > 10,000 ppmv				Date placed on Delay of Repair	Placed on Delay of Repair by Unit Supervisor w/in 30 days?	Is LDAR monitoring continuing while on Delay of Repair	For pumps, were best efforts used to isolate and repair?
						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0331NSPSLL01420	VALVE	BUTANE SPHERES NW SIDE OF BUTANE SPHERE 68 UNDER PIPE RACK MOV-1266	02/25/2002	7,097	NA	Placed on DOR before February 28, 2006							
0331NSPSLL01435	VALVE	NW SIDE OF BUTANE SPHERE 68 AT GPR (OLD MOV)	12/09/2003	2,391	NA	Placed on DOR before February 28, 2006							
0331NSPSLL01445	VALVE	MOV-1270 NE OF PUMP 128G-21B NE OF PROPANE BULLETS	12/09/2003	1,399	NA	Placed on DOR before February 28, 2006							
0331NSPSLL01456	VALVE	NW OF PUMP 128G-21B NE OF PROPANE BULLETS	09/21/2006	1,334	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/06/2006	TIMELY	Yes	NA
0331NSPSLL01458	VALVE	NW OF PUMP 128G-21B NE OF PROPANE BULLETS	12/04/2003	564	NA	Placed on DOR before February 28, 2006							
0331NSPSLL01461	VALVE	NW OF PUMP 128G-21B NE OF PROPANE BULLETS	11/20/2006	865	12/01/2006	Tighten	718	11/20/2006	TIMELY	12/05/2006	TIMELY	Yes	NA
						Previous repair	637	11/22/2006	TIMELY				
						Tighten packing	908	11/27/2006	TIMELY				
						Previous repair	718	11/30/2006	TIMELY				
						Tighten packing	26,100	12/01/2006	TIMELY				
						Previous repair	3,399	12/02/2006	TIMELY				
						Inject	570	12/04/2006	TIMELY				
						Previous repair	659	12/05/2006	TIMELY				
						Re-Inject	638	12/06/2006	TIMELY				
0331NSPSLL01519	VALVE	AT PUMP 31G-7 SW OF TK-421	11/20/2006	688	11/20/2006	Tighten	10,300	11/20/2006	TIMELY	12/05/2006	TIMELY	Yes	NA
						Previous repair	771	11/22/2006	TIMELY				
						Previous repair	2,485	11/29/2006	TIMELY				
						Tighten packing	1,165	11/30/2006	TIMELY				
						Previous repair	1,291	12/01/2006	TIMELY				
						Previous repair	659	12/04/2006	TIMELY				
						Previous repair	959	12/05/2006	TIMELY				
						Inject	722	12/06/2006	TIMELY				
						Valve is a Motor Operated Valve, and injection of this valve would have rendered it mechanically inoperable.							
0331NSPSLL01535	VALVE	UNDER NW END OF PLAT S SIDE OF LADDER MOV-1274 SPHERES	12/08/2009	3,463	12/08/2009	Steamed	19,100	12/08/2010	TIMELY	12/23/2009	TIMELY	Yes	NA
						Applied sealant	1,895	12/10/2010	TIMELY				
						Previous repair	10,400	12/22/2010	TIMELY				
						Previous repair	100,000	12/23/2010	TIMELY				
						Valve is a Motor Operated Valve, and injection of this valve would have rendered it mechanically inoperable.							
0331NSPSLL01540	VALVE	UNDER NW END OF PLAT E SIDE OF LADDER MOV-1273 SPHERES	04/09/2007	651	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	04/13/2007	TIMELY	Yes	NA
0331NSPSLL01547	RELIEF	PRV 131SV-975 W OF BUTANE SPHERE 68 IN AND UNDER PR	06/29/2006	7,121	06/29/2006	Not a Valve	Not a Valve	Not a Valve	Not a Valve	07/14/2006	TIMELY	Yes	NA
0331NSPSLL01566	VALVE	BUTANE SPHERES SW OF BUTANE SPHERE 68 IN AND UNDER PIPE RACK	10/30/2001	2,885	NA	Placed on DOR before February 28, 2006							
0331NSPSLL01576	VALVE	BUTANE SPHERES W SIDE OF BUTANE SPHERE 69	12/06/2003	3,370	NA	Placed on DOR before February 28, 2006							

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						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0331NSPSLL01742	VALVE	TANK 617 NE SIDE MOV 1911-2	02/03/2004	23,100	NA	Placed on DOR before February 28, 2006							
0331NSPSLL01770	RELIEF	PRV SV-1959 SW OPF TANK 609 ON S SIDE PMP	01/17/2007	20,500	01/17/2007	Not a Valve	Not a Valve	Not a Valve	Not a Valve	02/01/2007	TIMELY	Yes	NA
0331NSPSLL01856	VALVE	WLODARSKI JUNCTION W TO E	09/22/2006	627	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/07/2006	TIMELY	Yes	NA
0331NSPSLL01874	VALVE	N OF PUMP 31G-12	09/21/2006	13,600	09/21/2006	Tighten	8,953	09/21/2006	TIMELY	10/06/2006	TIMELY	Yes	NA
						Previous repair	16,500	09/25/2006	TIMELY				
						Previous repair	6,929	09/27/2006	TIMELY				
						Previous repair	6,069	09/28/2006	TIMELY				
						Previous repair	7,424	09/29/2006	TIMELY				
						Previous repair	5,864	10/02/2006	TIMELY				
						Tightened packing and applied sealant	8,149	10/03/2006	TIMELY				
						Previous repair	45,720	10/04/2006	TIMELY				
						Inject	1,267	10/05/2006	TIMELY				
						Inject	1,219	10/06/2006	TIMELY				
0331NSPSLL01908	VALVE	ON PLATFORM N OF BUTANE SPHERE 68	07/25/2008	1,505	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	08/09/2008	TIMELY	Yes	NA
0331NSPSLL01911	VALVE	331MOV-1265 NE END OF PLATFORM AT N SIDE OF BUTANE SPHERES	08/26/2007	6,357	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	07/24/2007	TIMELY	Yes	NA
0331NSPSLL01924	RELIEF	PRV 31SV-4016 E OF & OFF PLATFORM NORTH OF SPHERES	10/23/2007	4,453	NA	Not a Valve	Not a Valve	Not a Valve	Not a Valve	12/06/2007	LATE	Yes	NA
0331NSPSLL01938	VALVE	E OF PLATFORM N OF BUTANE SPHERE 68	04/08/2008	2,185	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	04/24/2008	TIMELY	Yes	NA
0331NSPSLL02111	VALVE	E OF TANK 432 PMP 31G-9A	04/15/2009	565	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	04/30/2009	TIMELY	Yes	NA
0331NSPSLL02221	VALVE	PUMP 31G-19B	10/20/2008	63,700	10/20/2008	Steam seal	27100	10/20/2008	TIMELY	11/05/2008	TIMELY	Yes	NA
						Tighten packing	923	10/21/2008	TIMELY				
						Tighten packing	2000	10/23/2008	TIMELY				
						Apply sealant	7653	10/27/2008	TIMELY				
						Previous repair	1164	11/04/2008	TIMELY				
0331NSPSLL02462	VALVE	SE OF TK-480 AT CTL BY ROAD W OF PUMP 31G-409	10/05/2006	682	10/20/2006	Tighten	611	10/05/2006	TIMELY	10/20/2006	TIMELY	Yes	NA
						Re-inject	558	10/16/2006	TIMELY				
						Re-inject	1,044	10/17/2006	TIMELY				
						Re-inject	3,115	10/19/2006	TIMELY				
						Previous repair	20,300	10/20/2006	TIMELY				
0331NSPSLL02473	VALVE	CTL BY ROAD W OF PMP 31G 409	10/05/2006	1,666	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/20/2006	TIMELY	Yes	NA
0331NSPSLL02632	VALVE	AT W SIDE OF TK-480	09/21/2006	830	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	10/06/2006	TIMELY	Yes	NA
0331NSPSLL02737	VALVE	SW SIDE OF TANK 406	08/29/2006	5,619	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	09/09/2006	TIMELY	Yes	NA
0331NSPSLL02775	VALVE	VALVE STATION S OF TANKS 425-429 IN PIPE WAY LOW POINT BLEEDER	03/05/2012	31,100	03/05/2012	Tightened	100,000	03/05/2012	NA	03/20/2012	TIMELY	Yes	NA
						Leak source: body/bonnet interface							
0331NSPSLL02908	VALVE	UNDER SPHERE TK-488	08/25/2006	1,460	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	09/09/2006	TIMELY	Yes	NA
0331NSPSLL02910	VALVE	BOTTOM OF SPHERE TK-488	11/20/2006	1,076	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	12/05/2006	TIMELY	Yes	NA

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						Repair Method	Monitoring results	Date of Repair Attempt	If injection or equivalent, timely? (i.e., injection or equivalent within 30 days)				
0331NSPSSL02912	VALVE	UNDER SPHERE TK-488	08/25/2006	12,400	08/25/2006	Tighten flange	10,200	08/25/2006	TIMELY	09/09/2006	TIMELY	Yes	NA
17812 (formerly 0331NSPSSL00702)	VALVE	AT E SIDE OF TK-439	10/04/2006	1,421	NA	Tighten flange	60,700	09/09/2006	TIMELY	10/19/2006	TIMELY	Yes	NA
						Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000				
0334NSPSGV00027	VALVE	ON RACK TRACK 1 AND S OF SPOT 2	02/11/2003	2,757	NA	► Placed on DOR before February 28, 2006							
0334NSPSGV00034	RELIEF	PRV 334SV-929	01/28/2003	16,200	NA	► Placed on DOR before February 28, 2006							
0334NSPSSL00029	VALVE	E OF 34F-3 SE OF 34F-4	02/22/2008	3,136	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	03/07/2008	TIMELY	Yes	NA
0334NSPSSL00059	VALVE	ON RACK TRACK 1 AND S OF SPOT 1	03/25/2003	3,846	NA	► Placed on DOR before February 28, 2006							
0334NSPSSL00150	VALVE	LOADING PLAT N OF N LOADING ROOM	05/21/2007	539	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	06/05/2007	TIMELY	Yes	NA
0334NSPSSL00215	VALVE	ON RACK TRACK 1 AND S OF SPOT 4	04/23/2003	8,510	NA	► Placed on DOR before February 28, 2006							
0334NSPSSL00223	VALVE	ON RACK TRACK 2 AND S OF SPOT 5	01/27/2003	8,933	NA	► Placed on DOR before February 28, 2006							
0334NSPSSL00224	VALVE	ON RACK TRACK 2 AND S OF SPOT 5	02/21/2003	28,191	NA	► Placed on DOR before February 28, 2006							
0334NSPSSL00304	VALVE	LOADING PLAT NE OF S LOADING ROOM	02/21/2004	3,004	NA	► Placed on DOR before February 28, 2006							
0334NSPSSL00328	VALVE	ON RACK TRACK 2 AND N OF SPOT 1	04/23/2003	1,668	NA	► Placed on DOR before February 28, 2006							
0590NSPSGV00407	VALVE	INSTRUMENT BLOCK VALVE OF 590PT-2213 ON 590V-6 TOP LANDING	01/16/2012	2,838	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	01/30/2012	TIMELY	Yes	NA
0590NSPSGV01163	VALVE	TIGHT SHUT OFF BLOCK ON LINE TO 59	3/22/2011	4,789	NA	Not > 10,000	Not > 10,000	Not > 10,000	Not > 10,000	03/07/2008	TIMELY	Yes	NA

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Period Totals
Effective 132
Ineffective 201
Worsen 63

Total 396

Category Code

- Effective: <= 200
- Ineffective: Remains between 200 and 499
- Worsen: > 499

Avg conc.change 167 ppmv increase
Avg emis. rate chnge 0.000060 lb/hr/attempt increase
Net emis. rate chnge 0.023769 lb/hr increase

No.	Tag Number	Initial Reading		Post Attempt Reading		Initial Repair Attempt	Repair Date Gap	Remonitor Date Gap	Repair Timeliness (OK if ≤ 5)	Remonitor Timeliness (OK if ≤ 5)	Post - Initial Reading	Category
		Date	PPM	PPM	Date	Date						
1	0115NSPSGV00086	7/3/2012	380	418	7/3/2012	7/3/2012	0	0	OK	OK	38	Ineffective
2	0116NSPSLL00306	7/9/2012	272	89	7/9/2012	7/9/2012	0	0	OK	OK	-183	Effective
3	0116NSPSLL00401	7/9/2012	326	206	7/9/2012	7/9/2012	0	0	OK	OK	-120	Ineffective
4	0119NSPSLL00069	7/19/2012	295	286	7/19/2012	7/19/2012	0	0	OK	OK	-9	Ineffective
5	0122HONGV00255	7/16/2012	368	319	7/16/2012	7/16/2012	0	0	OK	OK	-49	Ineffective
6	0122HONGV00445	7/24/2012	498	532	7/24/2012	7/24/2012	0	0	OK	OK	34	Worsen
7	0122HONGV00530	7/25/2012	327	390	7/25/2012	7/25/2012	0	0	OK	OK	63	Ineffective
8	0122HONGV00533	7/24/2012	396	423	7/24/2012	7/24/2012	0	0	OK	OK	27	Ineffective
9	0122HONGV00560	7/25/2012	264	887	7/25/2012	7/25/2012	0	0	OK	OK	623	Worsen
10	0122HONGV00597	7/24/2012	204	308	7/24/2012	7/24/2012	0	0	OK	OK	104	Ineffective
11	0122HONGV00723	7/27/2012	249	1145	7/27/2012	7/27/2012	0	0	OK	OK	896	Worsen
12	0122HONGV00765	7/31/2012	278	171	7/31/2012	7/31/2012	0	0	OK	OK	-107	Effective
13	0122HONGV00837	7/25/2012	440	466	7/25/2012	7/25/2012	0	0	OK	OK	26	Ineffective
14	0122HONLL00406	7/23/2012	201	229	7/23/2012	7/23/2012	0	0	OK	OK	28	Ineffective
15	0122HONLL00916	7/20/2012	385	745	7/20/2012	7/20/2012	0	0	OK	OK	360	Worsen
16	0122HONLL01425	7/23/2012	239	258	7/23/2012	7/23/2012	0	0	OK	OK	19	Ineffective
17	0122HONLL01455	7/19/2012	484	891	7/19/2012	7/19/2012	0	0	OK	OK	407	Worsen
18	0122HONLL01460	7/19/2012	221	179	7/19/2012	7/19/2012	0	0	OK	OK	-42	Effective
19	0122HONLL01565	7/19/2012	225	177	7/19/2012	7/19/2012	0	0	OK	OK	-48	Effective
20	0122HONLL01698	7/19/2012	496	300	7/19/2012	7/19/2012	0	0	OK	OK	-196	Ineffective
21	0122HONLL02003	7/24/2012	228	283	7/24/2012	7/24/2012	0	0	OK	OK	55	Ineffective
22	0122HONLL02274	7/24/2012	206	272	7/24/2012	7/24/2012	0	0	OK	OK	66	Ineffective
23	0122HONLL02428	7/26/2012	273	1194	7/26/2012	7/26/2012	0	0	OK	OK	921	Worsen
24	0122HONLL02441	7/24/2012	287	452	7/24/2012	7/24/2012	0	0	OK	OK	165	Ineffective
25	0122HONLL02632	7/26/2012	259	239	7/26/2012	7/26/2012	0	0	OK	OK	-20	Ineffective
26	0122HONLL02736	7/25/2012	282	173	7/25/2012	7/25/2012	0	0	OK	OK	-109	Effective
27	0122HONLL02792	7/25/2012	305	280	7/25/2012	7/25/2012	0	0	OK	OK	-25	Ineffective
28	0122HONLL02879	7/25/2012	266	190	7/25/2012	7/25/2012	0	0	OK	OK	-76	Effective

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Initial Repair Attempt Details
[130(b)(viii)]

Lemont Refinery
CITGO Petroleum Corporation
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July 1, 2012 to December 31, 2012

No.	Tag Number	Initial Reading Date	PPM	Post Attempt Reading PPM	Date	Initial Repair Attempt Date	Repair Date Gap	Remonitor Date Gap	Repair Timeliness (OK if ≤ 5)	Remonitor Timeliness (OK if ≤ 5)	Post - Initial Reading	Category
29	0122HONLL02917	7/25/2012	216	463	7/25/2012	7/25/2012	0	0	OK	OK	247	Ineffective
30	0122HONLL02924	7/26/2012	217	206	7/26/2012	7/26/2012	0	0	OK	OK	-11	Ineffective
31	0122HONLL03089	7/24/2012	230	474	7/24/2012	7/24/2012	0	0	OK	OK	244	Ineffective
32	0122HONLL03100	7/24/2012	249	992	7/24/2012	7/24/2012	0	0	OK	OK	743	Worsen
33	0122HONLL03124	7/24/2012	233	215	7/24/2012	7/24/2012	0	0	OK	OK	-18	Ineffective
34	0122HONLL03137	7/24/2012	263	222	7/24/2012	7/24/2012	0	0	OK	OK	-41	Ineffective
35	0122HONLL03457	7/25/2012	307	138	7/25/2012	7/25/2012	0	0	OK	OK	-169	Effective
36	0122HONLL03874	7/27/2012	466	188	7/27/2012	7/27/2012	0	0	OK	OK	-278	Effective
37	0122HONLL04149	7/24/2012	469	1391	7/24/2012	7/24/2012	0	0	OK	OK	922	Worsen
38	0122HONLL04150	7/24/2012	264	2028	7/24/2012	7/24/2012	0	0	OK	OK	1764	Worsen
39	0122HONLL04318	7/25/2012	239	231	7/25/2012	7/25/2012	0	0	OK	OK	-8	Ineffective
40	0122HONLL04323	7/25/2012	324	275	7/25/2012	7/25/2012	0	0	OK	OK	-49	Ineffective
41	0122HONLL00050	7/26/2012	282	571	7/26/2012	7/26/2012	0	0	OK	OK	289	Worsen
42	402006	7/2/2012	229	285	7/2/2012	7/2/2012	0	0	OK	OK	56	Ineffective
43	0125NSPSGV00435	7/12/2012	268	258	7/12/2012	7/12/2012	0	0	OK	OK	-10	Ineffective
44	0212NSPSLL00500	7/18/2012	298	174	7/18/2012	7/18/2012	0	0	OK	OK	-124	Effective
45	0217NSPSLL00117	7/6/2012	249	120	7/6/2012	7/6/2012	0	0	OK	OK	-129	Effective
46	0217NSPSLL00479	7/9/2012	376	428	7/9/2012	7/9/2012	0	0	OK	OK	52	Ineffective
47	0217NSPSLL00662	7/30/2012	235	210	7/30/2012	7/30/2012	0	0	OK	OK	-25	Ineffective
48	0217NSPSLL01022	7/5/2012	449	362	7/5/2012	7/5/2012	0	0	OK	OK	-87	Ineffective
49	0217NSPSLL01105	7/11/2012	324	399	7/11/2012	7/11/2012	0	0	OK	OK	75	Ineffective
50	0217NSPSLL01299	7/17/2012	243	148	7/17/2012	7/17/2012	0	0	OK	OK	-95	Effective
51	0217NSPSLL01323	7/3/2012	239	49	7/3/2012	7/3/2012	0	0	OK	OK	-190	Effective
52	0217NSPSLL01448	7/13/2012	355	444	7/13/2012	7/13/2012	0	0	OK	OK	89	Ineffective
53	0331HONLL00108	7/28/2012	313	926	7/28/2012	7/28/2012	0	0	OK	OK	613	Worsen
54	0331HONLL00142	7/27/2012	401	526	7/27/2012	7/27/2012	0	0	OK	OK	125	Worsen
55	0331HONLL00415	7/28/2012	270	360	7/28/2012	7/28/2012	0	0	OK	OK	90	Ineffective
56	0331HONLL00678	7/28/2012	225	1432	7/28/2012	7/28/2012	0	0	OK	OK	1207	Worsen
57	0331HONLL00737	7/30/2012	205	376	7/30/2012	7/30/2012	0	0	OK	OK	171	Ineffective
58	0331HONLL00766	7/30/2012	203	176	7/30/2012	7/30/2012	0	0	OK	OK	-27	Effective
59	0331HONLL00794	7/30/2012	399	282	7/30/2012	7/30/2012	0	0	OK	OK	-117	Ineffective
60	0331HONLL00821	7/31/2012	241	248	7/31/2012	7/31/2012	0	0	OK	OK	7	Ineffective
61	0331NSPSGV00108	7/31/2012	308	119	7/31/2012	7/31/2012	0	0	OK	OK	-189	Effective
62	0331NSPSGV00110	7/31/2012	322	305	7/31/2012	7/31/2012	0	0	OK	OK	-17	Ineffective

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No.	Tag Number	Initial Reading		Post Attempt Reading		Initial Repair Attempt	Repair Date Gap	Remonitor Date Gap	Repair Timeliness (OK if ≤ 5)	Remonitor Timeliness (OK if ≤ 5)	Post - Initial Reading	Category
		Date	PPM	PPM	Date	Date						
63	0331NSPSGV00123	7/28/2012	215	130	7/28/2012	7/28/2012	0	0	OK	OK	-85	Effective
64	0331NSPSLL00023	7/20/2012	459	161	7/20/2012	7/20/2012	0	0	OK	OK	-298	Effective
65	0331NSPSLL00094	7/18/2012	280	268	7/18/2012	7/18/2012	0	0	OK	OK	-12	Ineffective
66	0331NSPSLL00139	7/13/2012	223	122	7/13/2012	7/13/2012	0	0	OK	OK	-101	Effective
67	0331NSPSLL00176	7/17/2012	253	296	7/17/2012	7/17/2012	0	0	OK	OK	43	Ineffective
68	0331NSPSLL00185	7/26/2012	326	104	7/26/2012	7/26/2012	0	0	OK	OK	-222	Effective
69	0331NSPSLL00250	7/16/2012	211	73	7/16/2012	7/16/2012	0	0	OK	OK	-138	Effective
70	0331NSPSLL00280	7/16/2012	326	372	7/16/2012	7/16/2012	0	0	OK	OK	46	Ineffective
71	0331NSPSLL00339	7/16/2012	355	588	7/16/2012	7/16/2012	0	0	OK	OK	233	Worsen
72	0331NSPSLL00340	7/16/2012	245	255	7/16/2012	7/16/2012	0	0	OK	OK	10	Ineffective
73	0331NSPSLL00462	7/13/2012	478	746	7/13/2012	7/13/2012	0	0	OK	OK	268	Worsen
74	0331NSPSLL00465	7/13/2012	294	195	7/13/2012	7/13/2012	0	0	OK	OK	-99	Effective
75	0331NSPSLL00640	7/23/2012	228	243	7/23/2012	7/23/2012	0	0	OK	OK	15	Ineffective
76	0331NSPSLL00677	7/23/2012	297	202	7/23/2012	7/23/2012	0	0	OK	OK	-95	Ineffective
77	0331NSPSLL00756	7/12/2012	468	783	7/12/2012	7/12/2012	0	0	OK	OK	315	Worsen
78	0331NSPSLL00818	7/26/2012	349	242	7/26/2012	7/26/2012	0	0	OK	OK	-107	Ineffective
79	0331NSPSLL00994	7/12/2012	257	708	7/12/2012	7/12/2012	0	0	OK	OK	451	Worsen
80	0331NSPSLL01638	7/28/2012	342	492	7/28/2012	7/28/2012	0	0	OK	OK	150	Ineffective
81	0331NSPSLL01673	7/30/2012	403	229	7/30/2012	7/30/2012	0	0	OK	OK	-174	Ineffective
82	0331NSPSLL01715	7/28/2012	293	812	7/28/2012	7/28/2012	0	0	OK	OK	519	Worsen
83	0331NSPSLL01824	7/27/2012	268	97	7/27/2012	7/27/2012	0	0	OK	OK	-171	Effective
84	0331NSPSLL01891	7/27/2012	257	201	7/27/2012	7/27/2012	0	0	OK	OK	-56	Ineffective
85	0331NSPSLL02403	7/28/2012	247	434	7/28/2012	7/28/2012	0	0	OK	OK	187	Ineffective
86	031NSPSLL02476	7/28/2012	211	74	7/28/2012	7/28/2012	0	0	OK	OK	-137	Effective
87	0331NSPSLL02483	7/28/2012	263	769	7/28/2012	7/28/2012	0	0	OK	OK	506	Worsen
88	0331NSPSLL02651	7/27/2012	204	1429	7/27/2012	7/27/2012	0	0	OK	OK	1225	Worsen
89	0331NSPSLL02691	7/28/2012	271	580	7/28/2012	7/28/2012	0	0	OK	OK	309	Worsen
90	0331NSPSLL02735	7/17/2012	482	207	7/17/2012	7/17/2012	0	0	OK	OK	-275	Ineffective
91	0331NSPSLL03121	7/28/2012	291	253	7/28/2012	7/28/2012	0	0	OK	OK	-38	Ineffective
92	16330	7/31/2012	278	246	7/31/2012	7/31/2012	0	0	OK	OK	-32	Ineffective
93	0333HONLL00044	7/26/2012	475	1217	7/26/2012	7/26/2012	0	0	OK	OK	742	Worsen
94	0333NSPSLL00027	7/26/2012	490	341	7/26/2012	7/26/2012	0	0	OK	OK	-149	Ineffective
95	0333NSPSLL00045	7/26/2012	354	5489	7/26/2012	7/26/2012	0	0	OK	OK	5135	Worsen
96	0334NSPSGV00035	7/12/2012	232	40500	7/12/2012	7/12/2012	0	0	OK	OK	40268	Worsen

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No.	Tag Number	Initial Reading		Post Attempt Reading		Initial Repair Attempt	Repair Date Gap	Remonitor Date Gap	Repair Timeliness (OK if ≤ 5)	Remonitor Timeliness (OK if ≤ 5)	Post - Initial Reading	Category
		Date	PPM	PPM	Date	Date						
97	0334NSPSLL00107	7/12/2012	226	177	7/12/2012	7/12/2012	0	0	OK	OK	-49	Effective
98	0338NSPSLL00023	7/26/2012	361	143	7/26/2012	7/26/2012	0	0	OK	OK	-218	Effective
99	0338NSPSLL00118	7/26/2012	204	504	7/26/2012	7/26/2012	0	0	OK	OK	300	Worsen
100	0590NSPSGV00126	7/10/2012	331	303	7/10/2012	7/10/2012	0	0	OK	OK	-28	Ineffective
101	0590NSPSGV00159	7/5/2012	383	381	7/5/2012	7/5/2012	0	0	OK	OK	-2	Ineffective
102	0590NSPSGV00504	7/9/2012	212	129	7/9/2012	7/9/2012	0	0	OK	OK	-83	Effective
103	0111NSPSLL00085	8/3/2012	324	51	8/3/2012	8/3/2012	0	0	OK	OK	-273	Effective
104	0111NSPSLL00129	8/10/2012	258	352	8/10/2012	8/10/2012	0	0	OK	OK	94	Ineffective
105	0118NSPSGV00145	8/22/2012	269	147	8/22/2012	8/22/2012	0	0	OK	OK	-122	Effective
106	0118NSPSGV00294	8/22/2012	222	219	8/22/2012	8/22/2012	0	0	OK	OK	-3	Ineffective
107	0118NSPSLL00067	8/23/2012	201	269	8/23/2012	8/23/2012	0	0	OK	OK	68	Ineffective
108	0118NSPSLL00128	8/24/2012	274	230	8/24/2012	8/24/2012	0	0	OK	OK	-44	Ineffective
109	0118NSPSLL00334	8/27/2012	221	95	8/27/2012	8/27/2012	0	0	OK	OK	-126	Effective
110	0118NSPSLL00390	8/24/2012	272	307	8/24/2012	8/24/2012	0	0	OK	OK	35	Ineffective
111	0118NSPSLL00469	8/23/2012	306	120	8/23/2012	8/23/2012	0	0	OK	OK	-186	Effective
112	0122HONGV00255	8/28/2012	261	271	8/28/2012	8/28/2012	0	0	OK	OK	10	Ineffective
113	0122HONGV00514	8/24/2012	213	173	8/24/2012	8/24/2012	0	0	OK	OK	-40	Effective
114	0122HONGV00530	8/31/2012	304	530	8/31/2012	8/31/2012	0	0	OK	OK	226	Worsen
115	0122HONGV00531	8/27/2012	230	272	8/27/2012	8/27/2012	0	0	OK	OK	42	Ineffective
116	0122HONGV00545	8/27/2012	203	253	8/27/2012	8/27/2012	0	0	OK	OK	50	Ineffective
117	0122HONGV00566	8/27/2012	206	220	8/27/2012	8/27/2012	0	0	OK	OK	14	Ineffective
118	0122HONGV00592	8/27/2012	246	754	8/27/2012	8/27/2012	0	0	OK	OK	508	Worsen
119	0122HONLL00221	8/30/2012	256	119	8/30/2012	8/30/2012	0	0	OK	OK	-137	Effective
120	0122HONLL00468	8/29/2012	244	180	8/29/2012	8/29/2012	0	0	OK	OK	-64	Effective
121	0122HONLL00833	8/29/2012	466	380	8/29/2012	8/29/2012	0	0	OK	OK	-86	Ineffective
122	0122HONLL01059	8/29/2012	211	197	8/29/2012	8/29/2012	0	0	OK	OK	-14	Effective
123	0122HONLL01425	8/29/2012	219	295	8/29/2012	8/29/2012	0	0	OK	OK	76	Ineffective
124	0122HONLL01427	8/29/2012	326	2581	8/29/2012	8/29/2012	0	0	OK	OK	2255	Worsen
125	0122HONLL01429	8/29/2012	350	276	8/29/2012	8/29/2012	0	0	OK	OK	-74	Ineffective
126	0122HONLL01495	8/29/2012	205	272	8/29/2012	8/29/2012	0	0	OK	OK	67	Ineffective
127	0122HONLL01565	8/29/2012	217	230	8/29/2012	8/29/2012	0	0	OK	OK	13	Ineffective
128	0122HONLL01733	8/24/2012	330	1194	8/24/2012	8/24/2012	0	0	OK	OK	864	Worsen
129	0122HONLL02274	8/27/2012	205	357	8/27/2012	8/27/2012	0	0	OK	OK	152	Ineffective
130	0122HONLL02323	8/27/2012	259	602	8/27/2012	8/27/2012	0	0	OK	OK	343	Worsen

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No.	Tag Number	Initial Reading		Post Attempt Reading		Initial Repair Attempt	Repair Date Gap	Remonitor Date Gap	Repair Timeliness (OK if ≤ 5)	Remonitor Timeliness (OK if ≤ 5)	Post - Initial Reading	Category
		Date	PPM	PPM	Date	Date						
131	0122HONLL02426	8/30/2012	201	139	8/30/2012	8/30/2012	0	0	OK	OK	-62	Effective
132	0122HONLL02431	8/30/2012	255	692	8/30/2012	8/30/2012	0	0	OK	OK	437	Worsen
133	0122HONLL02462	8/30/2012	216	148	8/30/2012	8/30/2012	0	0	OK	OK	-68	Effective
134	0122HONLL02779	8/28/2012	265	364	8/28/2012	8/28/2012	0	0	OK	OK	99	Ineffective
135	0122HONLL02791	8/27/2012	232	161	8/27/2012	8/27/2012	0	0	OK	OK	-71	Effective
136	0122HONLL02917	8/31/2012	361	805	8/31/2012	8/31/2012	0	0	OK	OK	444	Worsen
137	0122HONLL03124	8/30/2012	258	164	8/30/2012	8/30/2012	0	0	OK	OK	-94	Effective
138	0122HONLL03186	8/27/2012	271	561	8/27/2012	8/27/2012	0	0	OK	OK	290	Worsen
139	0122HONLL03390	8/28/2012	206	157	8/28/2012	8/28/2012	0	0	OK	OK	-49	Effective
140	0122HONLL03769	8/29/2012	371	291	8/29/2012	8/29/2012	0	0	OK	OK	-80	Ineffective
141	0122HONLL04324	8/28/2012	253	179	8/28/2012	8/28/2012	0	0	OK	OK	-74	Effective
142	402004	8/29/2012	349	418	8/29/2012	8/29/2012	0	0	OK	OK	69	Ineffective
143	0123CR1GV00123	8/8/2012	287	291	8/8/2012	8/8/2012	0	0	OK	OK	4	Ineffective
144	0123CR1GV00139	8/17/2012	223	121	8/17/2012	8/17/2012	0	0	OK	OK	-102	Effective
145	0123CR1GV00256	8/13/2012	270	485	8/13/2012	8/13/2012	0	0	OK	OK	215	Ineffective
146	0123CR1GV00302	8/13/2012	211	229	8/13/2012	8/13/2012	0	0	OK	OK	18	Ineffective
147	0123CR1GV00546	8/6/2012	308	250	8/6/2012	8/6/2012	0	0	OK	OK	-58	Ineffective
148	0123CR1GV00574	8/15/2012	239	652	8/15/2012	8/15/2012	0	0	OK	OK	413	Worsen
149	0123CR1GV00764	8/9/2012	270	311	8/9/2012	8/9/2012	0	0	OK	OK	41	Ineffective
150	0123CR1GV00767	8/9/2012	295	216	8/9/2012	8/9/2012	0	0	OK	OK	-79	Ineffective
151	0123CR1GV00770	8/9/2012	207	1106	8/9/2012	8/9/2012	0	0	OK	OK	899	Worsen
152	0123CR1GV00824	8/3/2012	226	538	8/3/2012	8/3/2012	0	0	OK	OK	312	Worsen
153	0123CR1GV00942	8/9/2012	242	621	8/9/2012	8/9/2012	0	0	OK	OK	379	Worsen
154	0123CR1GV00974	8/13/2012	314	257	8/13/2012	8/13/2012	0	0	OK	OK	-57	Ineffective
155	0123CR1LL00034	8/1/2012	226	118	8/1/2012	8/1/2012	0	0	OK	OK	-108	Effective
156	0123CR1LL00095	8/1/2012	205	271	8/1/2012	8/1/2012	0	0	OK	OK	66	Ineffective
157	0123CR1LL00122	8/1/2012	497	986	8/1/2012	8/1/2012	0	0	OK	OK	489	Worsen
158	0123CR1LL00140	8/1/2012	218	159	8/1/2012	8/1/2012	0	0	OK	OK	-59	Effective
159	0123CR1LL00255	8/7/2012	207	927	8/7/2012	8/7/2012	0	0	OK	OK	720	Worsen
160	0123CR1LL00265	8/7/2012	319	182	8/7/2012	8/7/2012	0	0	OK	OK	-137	Effective
161	0123CR1LL00462	8/22/2012	275	81	8/22/2012	8/22/2012	0	0	OK	OK	-194	Effective
162	0123CR1LL00473	8/6/2012	225	328	8/6/2012	8/6/2012	0	0	OK	OK	103	Ineffective
163	0123CR1LL00557	8/7/2012	212	37	8/7/2012	8/7/2012	0	0	OK	OK	-175	Effective
164	0123CR1LL00605	8/8/2012	278	966	8/8/2012	8/8/2012	0	0	OK	OK	688	Worsen

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		Date	PPM	PPM	Date	Date						
165	0123CR1LL00628	8/8/2012	241	541	8/8/2012	8/8/2012	0	0	OK	OK	300	Worsen
166	0123CR1LL00753	8/9/2012	319	302	8/9/2012	8/9/2012	0	0	OK	OK	-17	Ineffective
167	0123CR1LL00818	8/13/2012	209	247	8/13/2012	8/13/2012	0	0	OK	OK	38	Ineffective
168	0123CR1LL00821	8/13/2012	282	994	8/13/2012	8/13/2012	0	0	OK	OK	712	Worsen
169	0123CR1LL00828	8/17/2012	265	271	8/17/2012	8/17/2012	0	0	OK	OK	6	Ineffective
170	0123CR1LL00885	8/10/2012	321	264	8/10/2012	8/10/2012	0	0	OK	OK	-57	Ineffective
171	0123CR1LL00891	8/17/2012	241	567	8/17/2012	8/17/2012	0	0	OK	OK	326	Worsen
172	0123CR1LL00901	8/9/2012	206	162	8/9/2012	8/9/2012	0	0	OK	OK	-44	Effective
173	0123CR1LL01079	8/9/2012	277	278	8/9/2012	8/9/2012	0	0	OK	OK	1	Ineffective
174	0123CR1LL01268	8/22/2012	350	1476	8/22/2012	8/22/2012	0	0	OK	OK	1126	Worsen
175	0123CR1LL01621	8/17/2012	224	250	8/17/2012	8/17/2012	0	0	OK	OK	26	Ineffective
176	0228NSPSLL00069	8/17/2012	301	139	8/17/2012	8/17/2012	0	0	OK	OK	-162	Effective
177	0228NSPSLL00072	8/17/2012	296	218	8/17/2012	8/17/2012	0	0	OK	OK	-78	Ineffective
178	0228NSPSLL00134	8/22/2012	301	253	8/22/2012	8/22/2012	0	0	OK	OK	-48	Ineffective
179	0228NSPSLL00500	8/17/2012	206	125	8/17/2012	8/17/2012	0	0	OK	OK	-81	Effective
180	0228NSPSLL00589	8/15/2012	359	247	8/15/2012	8/15/2012	0	0	OK	OK	-112	Ineffective
181	0228NSPSLL00991	8/20/2012	202	204	8/20/2012	8/20/2012	0	0	OK	OK	2	Ineffective
182	0331HONLL00076	8/31/2012	435	399	8/31/2012	8/31/2012	0	0	OK	OK	-36	Ineffective
183	0331HONLL00148	8/31/2012	348	206	8/31/2012	8/31/2012	0	0	OK	OK	-142	Ineffective
184	0331HONLL00537	8/30/2012	491	3418	8/30/2012	8/30/2012	0	0	OK	OK	2927	Worsen
185	0331HONLL00630	8/30/2012	384	474	8/30/2012	8/30/2012	0	0	OK	OK	90	Ineffective
186	0331NSPSGV00047	8/1/2012	219	210	8/1/2012	8/1/2012	0	0	OK	OK	-9	Ineffective
187	0331NSPSLL00389	8/30/2012	246	225	8/30/2012	8/30/2012	0	0	OK	OK	-21	Ineffective
188	0331NSPSLL01192	8/1/2012	462	404	8/1/2012	8/1/2012	0	0	OK	OK	-58	Ineffective
189	0331NSPSLL01895	8/1/2012	304	448	8/1/2012	8/1/2012	0	0	OK	OK	144	Ineffective
190	0334NSPSLL00126	8/29/2012	294	276	8/29/2012	8/29/2012	0	0	OK	OK	-18	Ineffective
191	0335NSPSLL00090	8/23/2012	279	64	8/23/2012	8/23/2012	0	0	OK	OK	-215	Effective
192	0338NSPSLL00118	8/2/2012	214	183	8/2/2012	8/2/2012	0	0	OK	OK	-31	Effective
193	0102NSPSGV00271	9/11/2012	256	227	9/11/2012	9/11/2012	0	0	OK	OK	-29	Ineffective
194	0102NSPSGV00294	9/12/2012	229	207	9/12/2012	9/12/2012	0	0	OK	OK	-22	Ineffective
195	0102NSPSGV00361	9/12/2012	226	567	9/12/2012	9/12/2012	0	0	OK	OK	341	Worsen
196	0102NSPSGV00832	9/5/2012	324	278	9/5/2012	9/5/2012	0	0	OK	OK	-46	Ineffective
197	0102NSPSLL00312	9/7/2012	308	17	9/7/2012	9/7/2012	0	0	OK	OK	-291	Effective
198	0102NSPSLL00436	9/11/2012	246	143	9/11/2012	9/11/2012	0	0	OK	OK	-103	Effective

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No.	Tag Number	Initial Reading Date	PPM	Post Attempt Reading PPM	Date	Initial Repair Attempt Date	Repair Date Gap	Remonitor Date Gap	Repair Timeliness (OK if ≤ 5)	Remonitor Timeliness (OK if ≤ 5)	Post - Initial Reading	Category
199	0102NSPSLL00591	9/11/2012	249	565	9/11/2012	9/11/2012	0	0	OK	OK	316	Worsen
200	0102NSPSLL00609	9/7/2012	319	300	9/7/2012	9/7/2012	0	0	OK	OK	-19	Ineffective
201	0103NSPSGV00020	9/22/2012	303	42	9/22/2012	9/22/2012	0	0	OK	OK	-261	Effective
202	0103NSPSGV00533	9/21/2012	281	31	9/21/2012	9/21/2012	0	0	OK	OK	-250	Effective
203	0103NSPSLL00044	9/24/2012	218	250	9/24/2012	9/24/2012	0	0	OK	OK	32	Ineffective
204	0103NSPSLL00165	9/24/2012	370	281	9/24/2012	9/24/2012	0	0	OK	OK	-89	Ineffective
205	0113NSPSGV00601	9/17/2012	247	148	9/17/2012	9/17/2012	0	0	OK	OK	-99	Effective
206	0114NSPSGV00232	9/4/2012	201	207	9/4/2012	9/4/2012	0	0	OK	OK	6	Ineffective
207	0114NSPSGV00451	9/10/2012	245	290	9/10/2012	9/10/2012	0	0	OK	OK	45	Ineffective
208	0114NSPSLL00003	9/6/2012	215	184	9/6/2012	9/6/2012	0	0	OK	OK	-31	Effective
209	0114NSPSLL00009	9/6/2012	310	229	9/6/2012	9/6/2012	0	0	OK	OK	-81	Ineffective
210	0114NSPSLL00057	9/4/2012	229	164	9/4/2012	9/4/2012	0	0	OK	OK	-65	Effective
211	0114NSPSLL00182	9/5/2012	254	113	9/5/2012	9/5/2012	0	0	OK	OK	-141	Effective
212	0114NSPSLL00235	9/6/2012	279	280	9/6/2012	9/6/2012	0	0	OK	OK	1	Ineffective
213	0114NSPSLL00269	9/4/2012	332	339	9/4/2012	9/4/2012	0	0	OK	OK	7	Ineffective
214	0114NSPSLL00327	9/5/2012	250	276	9/5/2012	9/5/2012	0	0	OK	OK	26	Ineffective
215	0114NSPSLL00328	9/5/2012	249	253	9/5/2012	9/5/2012	0	0	OK	OK	4	Ineffective
216	0114NSPSLL00340	9/5/2012	271	96	9/5/2012	9/5/2012	0	0	OK	OK	-175	Effective
217	0114NSPSLL00391	9/10/2012	207	562	9/10/2012	9/10/2012	0	0	OK	OK	355	Worsen
218	0114NSPSLL00415	9/6/2012	221	143	9/6/2012	9/6/2012	0	0	OK	OK	-78	Effective
219	0114NSPSLL00619	9/11/2012	216	232	9/11/2012	9/11/2012	0	0	OK	OK	16	Ineffective
220	0116NSPSGV00196	9/14/2012	221	319	9/14/2012	9/14/2012	0	0	OK	OK	98	Ineffective
221	0116NSPSGV00239	9/12/2012	242	113	9/12/2012	9/12/2012	0	0	OK	OK	-129	Effective
222	0116NSPSGV00327	9/13/2012	256	289	9/13/2012	9/13/2012	0	0	OK	OK	33	Ineffective
223	0116NSPSGV00543	9/13/2012	469	92	9/13/2012	9/13/2012	0	0	OK	OK	-377	Effective
224	0116NSPSGV00572	9/18/2012	210	17	9/18/2012	9/18/2012	0	0	OK	OK	-193	Effective
225	0116NSPSLL00067	9/14/2012	208	184	9/14/2012	9/14/2012	0	0	OK	OK	-24	Effective
226	0116NSPSLL00110	9/14/2012	266	62	9/14/2012	9/14/2012	0	0	OK	OK	-204	Effective
227	0116NSPSLL00118	9/14/2012	216	237	9/14/2012	9/14/2012	0	0	OK	OK	21	Ineffective
228	0116NSPSLL00214	9/13/2012	213	17	9/13/2012	9/13/2012	0	0	OK	OK	-196	Effective
229	0116NSPSLL00218	9/13/2012	208	174	9/13/2012	9/13/2012	0	0	OK	OK	-34	Effective
230	0116NSPSLL00267	9/12/2012	263	349	9/12/2012	9/12/2012	0	0	OK	OK	86	Ineffective
231	0116NSPSLL00401	9/14/2012	203	29	9/14/2012	9/14/2012	0	0	OK	OK	-174	Effective
232	0120NSPSLL00053	9/21/2012	295	122	9/21/2012	9/21/2012	0	0	OK	OK	-173	Effective

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		Date	PPM	PPM	Date							
233	0120NSPSLL00183	9/18/2012	295	254	9/18/2012	9/18/2012	0	0	OK	OK	-41	Ineffective
234	0120NSPSLL00925	9/21/2012	284	85	9/21/2012	9/21/2012	0	0	OK	OK	-199	Effective
235	0120NSPSLL00960	9/21/2012	226	211	9/21/2012	9/21/2012	0	0	OK	OK	-15	Ineffective
236	0120NSPSLL01367	9/20/2012	263	9	9/20/2012	9/20/2012	0	0	OK	OK	-254	Effective
237	0121NSPSLL00006	9/14/2012	245	108	9/14/2012	9/14/2012	0	0	OK	OK	-137	Effective
238	0122HONGV00537	9/25/2012	462	438	9/25/2012	9/25/2012	0	0	OK	OK	-24	Ineffective
239	0122HONLL00146	9/24/2012	204	24	9/24/2012	9/24/2012	0	0	OK	OK	-180	Effective
240	0122HONLL00463	9/21/2012	271	147	9/21/2012	9/21/2012	0	0	OK	OK	-124	Effective
241	0122HONLL01997	9/24/2012	389	448	9/24/2012	9/24/2012	0	0	OK	OK	59	Ineffective
242	0122HONLL02082	9/26/2012	271	125	9/26/2012	9/26/2012	0	0	OK	OK	-146	Effective
243	0122HONLL02274	9/25/2012	319	102	9/25/2012	9/25/2012	0	0	OK	OK	-217	Effective
244	0122HONLL02791	9/26/2012	445	410	9/26/2012	9/26/2012	0	0	OK	OK	-35	Ineffective
245	0122HONLL02879	9/25/2012	251	217	9/25/2012	9/25/2012	0	0	OK	OK	-34	Ineffective
246	0122HONLL03124	9/25/2012	223	102	9/25/2012	9/25/2012	0	0	OK	OK	-121	Effective
247	0122HONLL03390	9/26/2012	238	195	9/26/2012	9/26/2012	0	0	OK	OK	-43	Effective
248	0122HONLL03464	9/27/2012	225	212	9/27/2012	9/27/2012	0	0	OK	OK	-13	Ineffective
249	0122HONLL04324	9/26/2012	226	222	9/26/2012	9/26/2012	0	0	OK	OK	-4	Ineffective
250	0212NSPSGV00052	9/5/2012	296	222	9/5/2012	9/5/2012	0	0	OK	OK	-74	Ineffective
251	0212NSPSGV00284	9/14/2012	268	182	9/14/2012	9/14/2012	0	0	OK	OK	-86	Effective
252	0212NSPSLL00756	9/14/2012	245	178	9/14/2012	9/14/2012	0	0	OK	OK	-67	Effective
253	0212NSPSLL01212	9/11/2012	393	271	9/11/2012	9/11/2012	0	0	OK	OK	-122	Ineffective
254	401871	9/5/2012	280	28	9/5/2012	9/5/2012	0	0	OK	OK	-252	Effective
255	0228NSPSLL00990	9/4/2012	435	342	9/4/2012	9/4/2012	0	0	OK	OK	-93	Ineffective
256	0331HONLL00148	9/4/2012	226	436	9/4/2012	9/4/2012	0	0	OK	OK	210	Ineffective
257	0331HONLL00386	9/4/2012	323	384	9/4/2012	9/4/2012	0	0	OK	OK	61	Ineffective
258	0331HONLL00432	9/22/2012	268	52	9/22/2012	9/22/2012	0	0	OK	OK	-216	Effective
259	0331HONLL00651	9/22/2012	242	93	9/22/2012	9/22/2012	0	0	OK	OK	-149	Effective
260	0331NSPSLL01279	9/10/2012	227	125	9/10/2012	9/10/2012	0	0	OK	OK	-102	Effective
261	0331NSPSLL01575	9/5/2012	306	438	9/5/2012	9/5/2012	0	0	OK	OK	132	Ineffective
262	0331NSPSLL02150	9/10/2012	239	311	9/10/2012	9/10/2012	0	0	OK	OK	72	Ineffective
263	0590NSPSGV00549	9/4/2012	422	122	9/4/2012	9/4/2012	0	0	OK	OK	-300	Effective
264	0112NSPSGV00507	10/4/2012	262	236	10/4/2012	10/4/2012	0	0	OK	OK	-26	Ineffective
265	0114NSPSGV00407	10/5/2012	216	182	10/5/2012	10/5/2012	0	0	OK	OK	-34	Effective
266	0116NSPSGV00560	10/4/2012	300	42	10/4/2012	10/4/2012	0	0	OK	OK	-258	Effective

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267	15470	10/3/2012	315	40	10/3/2012	10/3/2012	0	0	OK	OK	-275	Effective
268	0121NSPSGV00039	10/5/2012	267	289	10/5/2012	10/5/2012	0	0	OK	OK	22	Ineffective
269	0122HONGV00295	10/23/2012	369	273	10/23/2012	10/23/2012	0	0	OK	OK	-96	Ineffective
270	0122HONGV00386	10/23/2012	221	168	10/23/2012	10/23/2012	0	0	OK	OK	-53	Effective
271	0122HONGV00453	10/19/2012	213	69	10/19/2012	10/19/2012	0	0	OK	OK	-144	Effective
272	0122HONGV00531	10/18/2012	215	56	10/18/2012	10/18/2012	0	0	OK	OK	-159	Effective
273	0122HONLL00450	10/24/2012	258	194	10/24/2012	10/24/2012	0	0	OK	OK	-64	Effective
274	0122HONLL00896	10/24/2012	209	126	10/24/2012	10/24/2012	0	0	OK	OK	-83	Effective
275	0122HONLL01030	10/24/2012	204	206	10/24/2012	10/24/2012	0	0	OK	OK	2	Ineffective
276	0122HONLL01042	10/15/2012	324	379	10/15/2012	10/15/2012	0	0	OK	OK	55	Ineffective
277	0122HONLL01059	10/23/2012	264	610	10/23/2012	10/23/2012	0	0	OK	OK	346	Worsen
278	0122HONLL01061	10/23/2012	246	667	10/23/2012	10/23/2012	0	0	OK	OK	421	Worsen
279	0122HONLL01222	10/24/2012	205	275	10/24/2012	10/24/2012	0	0	OK	OK	70	Ineffective
280	0122HONLL01348	10/24/2012	235	204	10/24/2012	10/24/2012	0	0	OK	OK	-31	Ineffective
281	0122HONLL01472	10/17/2012	331	23	10/17/2012	10/17/2012	0	0	OK	OK	-308	Effective
282	0122HONLL02779	10/19/2012	202	159	10/19/2012	10/19/2012	0	0	OK	OK	-43	Effective
283	0122HONLL03376	10/31/2012	224	327	10/31/2012	10/31/2012	0	0	OK	OK	103	Ineffective
284	0122HONLL03390	10/12/2012	218	152	10/12/2012	10/12/2012	0	0	OK	OK	-66	Effective
285	0122HONLL03470	10/22/2012	280	237	10/22/2012	10/22/2012	0	0	OK	OK	-43	Ineffective
286	0122HONLL04322	10/22/2012	237	284	10/22/2012	10/22/2012	0	0	OK	OK	47	Ineffective
287	0217NSPSGV00090	10/15/2012	290	338	10/15/2012	10/15/2012	0	0	OK	OK	48	Ineffective
288	0217NSPSGV00694	10/12/2012	307	227	10/12/2012	10/12/2012	0	0	OK	OK	-80	Ineffective
289	0217NSPSGV00703	10/5/2012	407	363	10/5/2012	10/5/2012	0	0	OK	OK	-44	Ineffective
290	0217NSPSLL00179	10/5/2012	223	1322	10/5/2012	10/5/2012	0	0	OK	OK	1099	Worsen
291	0217NSPSLL00241	10/16/2012	341	46	10/16/2012	10/16/2012	0	0	OK	OK	-295	Effective
292	0217NSPSLL00414	10/5/2012	345	239	10/5/2012	10/5/2012	0	0	OK	OK	-106	Ineffective
293	0217NSPSLL00616	10/16/2012	239	249	10/16/2012	10/16/2012	0	0	OK	OK	10	Ineffective
294	0217NSPSLL00638	10/8/2012	366	954	10/8/2012	10/8/2012	0	0	OK	OK	588	Worsen
295	0217NSPSLL01313	10/11/2012	288	160	10/11/2012	10/11/2012	0	0	OK	OK	-128	Effective
296	0217NSPSLL01449	10/5/2012	204	67	10/5/2012	10/5/2012	0	0	OK	OK	-137	Effective
297	0217NSPSLL01853	10/5/2012	294	301	10/5/2012	10/5/2012	0	0	OK	OK	7	Ineffective
298	0228NSPSLL00040	10/4/2012	350	596	10/4/2012	10/4/2012	0	0	OK	OK	246	Worsen
299	0228NSPSLL00741	10/4/2012	262	1588	10/4/2012	10/4/2012	0	0	OK	OK	1326	Worsen
300	0331HONLL00075	10/15/2012	264	267	10/15/2012	10/15/2012	0	0	OK	OK	3	Ineffective

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		Date	PPM	PPM	Date	Date						
301	0331HONLL00148	10/15/2012	288	246	10/15/2012	10/15/2012	0	0	OK	OK	-42	Ineffective
302	0331HONLL00386	10/17/2012	260	286	10/17/2012	10/17/2012	0	0	OK	OK	26	Ineffective
303	0331HONLL00529	10/19/2012	213	231	10/19/2012	10/19/2012	0	0	OK	OK	18	Ineffective
304	0331HONLL00768	10/18/2012	243	265	10/18/2012	10/18/2012	0	0	OK	OK	22	Ineffective
305	0331HONLL00790	10/18/2012	205	217	10/18/2012	10/18/2012	0	0	OK	OK	12	Ineffective
306	0331HONLL00806	10/9/2012	209	225	10/9/2012	10/9/2012	0	0	OK	OK	16	Ineffective
307	0331HONLL01049	10/23/2012	267	183	10/23/2012	10/23/2012	0	0	OK	OK	-84	Effective
308	0331NSPSGV00135	10/2/2012	408	381	10/2/2012	10/2/2012	0	0	OK	OK	-27	Ineffective
309	0331NSPSLL00094	10/11/2012	249	66	10/11/2012	10/11/2012	0	0	OK	OK	-183	Effective
310	0331NSPSLL00933	10/9/2012	223	207	10/9/2012	10/9/2012	0	0	OK	OK	-16	Ineffective
311	0331NSPSLL00814	10/1/2012	262	152	10/1/2012	10/1/2012	0	0	OK	OK	-110	Effective
312	0331NSPSLL01108	10/1/2012	216	150	10/1/2012	10/1/2012	0	0	OK	OK	-66	Effective
313	0331NSPSLL01638	10/16/2012	225	215	10/16/2012	10/16/2012	0	0	OK	OK	-10	Ineffective
314	0331NSPSLL01642	10/16/2012	251	273	10/16/2012	10/16/2012	0	0	OK	OK	22	Ineffective
315	0331NSPSLL01668	10/17/2012	424	427	10/17/2012	10/17/2012	0	0	OK	OK	3	Ineffective
316	0331NSPSLL01682	10/8/2012	296	69	10/8/2012	10/8/2012	0	0	OK	OK	-227	Effective
317	0331NSPSLL01723	10/18/2012	476	206	10/18/2012	10/18/2012	0	0	OK	OK	-270	Ineffective
318	0331SNPSLL01738	10/18/2012	403	387	10/18/2012	10/18/2012	0	0	OK	OK	-16	Ineffective
319	0331NSPSLL02000	10/8/2012	374	196	10/8/2012	10/8/2012	0	0	OK	OK	-178	Effective
320	0331NSPSLL02130	10/2/2012	233	152	10/2/2012	10/2/2012	0	0	OK	OK	-81	Effective
321	0331NSPSLL02529	10/8/2012	209	92	10/8/2012	10/8/2012	0	0	OK	OK	-117	Effective
322	0331NSPSLL03058	10/15/2012	227	238	10/15/2012	10/15/2012	0	0	OK	OK	11	Ineffective
323	0338HONLL00142	10/23/2012	473	214	10/23/2012	10/23/2012	0	0	OK	OK	-259	Ineffective
324	0338NSPSLL00104	10/23/2012	494	211	10/23/2012	10/23/2012	0	0	OK	OK	-283	Ineffective
325	0590NSPSGV00155	10/5/2012	234	228	10/5/2012	10/5/2012	0	0	OK	OK	-6	Ineffective
326	0590NSPSGV00159	10/5/2012	229	273	10/5/2012	10/5/2012	0	0	OK	OK	44	Ineffective
327	0111NSPSGV01079	11/2/2012	357	1157	11/2/2012	11/2/2012	0	0	OK	OK	800	Worsen
328	0111NSPSLL00331	11/1/2012	261	232	11/1/2012	11/1/2012	0	0	OK	OK	-29	Ineffective
329	0111NSPSLL01429	11/9/2012	228	239	11/9/2012	11/9/2012	0	0	OK	OK	11	Ineffective
330	401200	11/8/2012	296	80	11/8/2012	11/8/2012	0	0	OK	OK	-216	Effective
331	0118NSPSGV00065	11/26/2012	228	140	11/26/2012	11/26/2012	0	0	OK	OK	-88	Effective
332	0118NSPSGV00286	11/26/2012	221	181	11/26/2012	11/26/2012	0	0	OK	OK	-40	Effective
333	0118NSPSLL00348	11/29/2012	232	184	11/29/2012	11/29/2012	0	0	OK	OK	-48	Effective
334	0118NSPSLL00981	11/28/2012	259	95	11/28/2012	11/28/2012	0	0	OK	OK	-164	Effective

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335	0120NSPSGV00112	11/5/2012	336	256	11/5/2012	11/5/2012	0	0	OK	OK	-80	Ineffective
336	0120NSPSLL01433	11/5/2012	263	281	11/5/2012	11/5/2012	0	0	OK	OK	18	Ineffective
337	0123CR1GV00130	11/15/2012	467	474	11/15/2012	11/15/2012	0	0	OK	OK	7	Ineffective
338	0123CR1GV00450	11/14/2012	220	317	11/14/2012	11/14/2012	0	0	OK	OK	97	Ineffective
339	0123CR1LL00034	11/1/2012	327	427	11/1/2012	11/1/2012	0	0	OK	OK	100	Ineffective
340	0123CR1LL00753	11/19/2012	322	288	11/19/2012	11/19/2012	0	0	OK	OK	-34	Ineffective
341	0123CR1LL00821	11/21/2012	309	350	11/21/2012	11/21/2012	0	0	OK	OK	41	Ineffective
342	0123CR1LL00828	11/14/2012	254	320	11/14/2012	11/14/2012	0	0	OK	OK	66	Ineffective
343	0123CR1LL00885	11/14/2012	288	218	11/14/2012	11/14/2012	0	0	OK	OK	-70	Ineffective
344	0125NSPSGV00170	11/9/2012	215	102	11/9/2012	11/9/2012	0	0	OK	OK	-113	Effective
345	0228NSPSLL00069	11/2/2012	223	159	11/2/2012	11/2/2012	0	0	OK	OK	-64	Effective
346	0228NSPSLL00108	11/2/2012	270	321	11/2/2012	11/2/2012	0	0	OK	OK	51	Ineffective
347	0228NSPSLL00415	11/8/2012	354	617	11/8/2012	11/8/2012	0	0	OK	OK	263	Worsen
348	0228NSPSLL00438	11/5/2012	226	198	11/5/2012	11/5/2012	0	0	OK	OK	-28	Effective
349	0228SNPSLL00583	11/2/2012	209	2284	11/2/2012	11/2/2012	0	0	OK	OK	2075	Worsen
350	0228NSPSLL00777	11/8/2012	348	189	11/8/2012	11/8/2012	0	0	OK	OK	-159	Effective
351	0228NSPSLL00915	11/7/2012	356	265	11/7/2012	11/7/2012	0	0	OK	OK	-91	Ineffective
352	0331NSPSLL02101	11/7/2012	300	229	11/7/2012	11/7/2012	0	0	OK	OK	-71	Ineffective
353	0331NSPSLL03057	11/7/2012	259	141	11/7/2012	11/7/2012	0	0	OK	OK	-118	Effective
354	0334NSPSLL00182	11/19/2012	371	638	11/19/2012	11/19/2012	0	0	OK	OK	267	Worsen
355	0334NSPSLL00188	11/19/2012	292	53	11/19/2012	11/19/2012	0	0	OK	OK	-239	Effective
356	0334NSPSLL00199	11/19/2012	358	222	11/19/2012	11/19/2012	0	0	OK	OK	-136	Ineffective
357	0334NSPSLL00207	11/19/2012	319	122	11/19/2012	11/19/2012	0	0	OK	OK	-197	Effective
358	0334NSPSLL00309	11/26/2012	368	264	11/26/2012	11/26/2012	0	0	OK	OK	-104	Ineffective
359	0335NSPSLL00131	11/28/2012	335	239	11/28/2012	11/28/2012	0	0	OK	OK	-96	Ineffective
360	0590NSPSGV01355	11/1/2012	328	237	11/1/2012	11/1/2012	0	0	OK	OK	-91	Ineffective
361	0102NSPSGV00294	12/17/2012	400	250	12/17/2012	12/17/2012	0	0	OK	OK	-150	Ineffective
362	0102NSPSGV00362	12/17/2012	205	565	12/17/2012	12/17/2012	0	0	OK	OK	360	Worsen
363	0102NSPSGV00369	12/17/2012	292	505	12/17/2012	12/17/2012	0	0	OK	OK	213	Worsen
364	0102NSPSLL00408	12/14/2012	413	251	12/14/2012	12/14/2012	0	0	OK	OK	-162	Ineffective
365	0102NSPSLL00720	12/14/2012	445	483	12/14/2012	12/14/2012	0	0	OK	OK	38	Ineffective
366	0102NSPSLL00805	12/18/2012	230	1581	12/18/2012	12/18/2012	0	0	OK	OK	1351	Worsen
367	404888	12/8/2012	335	52	12/8/2012	12/8/2012	0	0	OK	OK	-283	Effective
368	0108NSPSGV00009	12/8/2012	329	188	12/8/2012	12/8/2012	0	0	OK	OK	-141	Effective

ATTACHMENT 9, Appendix D
Initial Repair Attempt Details
[130(b)(viii)]

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No.	Tag Number	Initial Reading Date	PPM	Post Attempt Reading PPM	Date	Initial Repair Attempt Date	Repair Date Gap	Remonitor Date Gap	Repair Timeliness (OK if ≤ 5)	Remonitor Timeliness (OK if ≤ 5)	Post - Initial Reading	Category
369	0112NSPSGV00075	12/13/2012	399	431	12/13/2012	12/13/2012	0	0	OK	OK	32	Ineffective
370	0112NSPSGV00252	12/21/2012	220	283	12/21/2012	12/21/2012	0	0	OK	OK	63	Ineffective
371	0122NSPSLL00389	12/7/2012	479	172	12/7/2012	12/7/2012	0	0	OK	OK	-307	Effective
372	0114NSPSLL00009	12/11/2012	222	132	12/11/2012	12/11/2012	0	0	OK	OK	-90	Effective
373	0116NSPSGV00130	12/12/2012	325	204	12/12/2012	12/12/2012	0	0	OK	OK	-121	Ineffective
374	0116NSPSGV00228	12/11/2012	233	146	12/11/2012	12/11/2012	0	0	OK	OK	-87	Effective
375	0116NSPSGV00560	12/11/2012	363	116	12/11/2012	12/11/2012	0	0	OK	OK	-247	Effective
376	0120NSPSGV00051	12/19/2012	343	338	12/19/2012	12/19/2012	0	0	OK	OK	-5	Ineffective
377	0120NSPSGV00058	12/19/2012	342	249	12/19/2012	12/19/2012	0	0	OK	OK	-93	Ineffective
378	0120NSPSGV00073	12/10/2012	236	352	12/10/2012	12/10/2012	0	0	OK	OK	116	Ineffective
379	0120NSPSGV00076	12/10/2012	202	1790	12/10/2012	12/10/2012	0	0	OK	OK	1588	Worsen
380	0120NSPSGV00242	12/12/2012	275	254	12/12/2012	12/12/2012	0	0	OK	OK	-21	Ineffective
381	0120NSPSLL00183	12/12/2012	426	269	12/12/2012	12/12/2012	0	0	OK	OK	-157	Ineffective
382	0120NSPSLL00537	12/10/2012	468	12	12/10/2012	12/10/2012	0	0	OK	OK	-456	Effective
383	0120NSPSLL00960	12/8/2012	291	241	12/8/2012	12/8/2012	0	0	OK	OK	-50	Ineffective
384	0212NSPSGV00086	12/6/2012	343	899	12/6/2012	12/6/2012	0	0	OK	OK	556	Worsen
385	0212NSPSGV00102	12/5/2012	249	96	12/5/2012	12/5/2012	0	0	OK	OK	-153	Effective
386	0212NSPSGV00193	12/7/2012	317	279	12/7/2012	12/7/2012	0	0	OK	OK	-38	Ineffective
387	0212NSPSGV00284	12/7/2012	203	108	12/7/2012	12/7/2012	0	0	OK	OK	-95	Effective
388	0212NSPSGV00543	12/7/2012	284	246	12/7/2012	12/7/2012	0	0	OK	OK	-38	Ineffective
389	0212NSPSLL00062	12/3/2012	461	117	12/3/2012	12/3/2012	0	0	OK	OK	-344	Effective
390	0212NSPSLL00283	12/5/2012	356	28	12/5/2012	12/5/2012	0	0	OK	OK	-328	Effective
391	0212NSPSLL00324	12/5/2012	348	290	12/5/2012	12/5/2012	0	0	OK	OK	-58	Ineffective
392	0212NSPSLL00843	12/6/2012	233	42	12/6/2012	12/6/2012	0	0	OK	OK	-191	Effective
393	0331HONLL00793	12/6/2012	340	393	12/6/2012	12/6/2012	0	0	OK	OK	53	Ineffective
394	0331NSPSLL00818	12/7/2012	248	289	12/7/2012	12/7/2012	0	0	OK	OK	41	Ineffective
395	0331NSPSLL03057	12/10/2012	256	235	12/10/2012	12/10/2012	0	0	OK	OK	-21	Ineffective
396	404755	12/20/2012	262	28	12/20/2012	12/20/2012	0	0	OK	OK	-234	Effective

ATTACHMENT 9, Appendix E
Internal Leak Definition Repair Information
[130(b)(ix)]

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Pumps (in light liquid service) and Valves (in light liquid and/or gas vapor service, and other than pressure relief devices) with no initial repair attempt and/or re-monitoring and at Internal Leak Threshold within 5 days

Compliance Group	Tag	Class	Date Reported	First Attempt Due Date	Initial Repair Date	Initial Retest Date	Issue	Note
No Pumps (in light liquid service) and Valves (in light liquid and/or gas vapor service, and other than pressure relief devices) leaking at the Internal Leak Threshold had no initial repair attempt and/or re-monitoring within 5 days								

Pumps (in light liquid service) and Valves (in light liquid and/or gas-vapor service, and other than pressure relief devices) leaking above internal threshold not repaired within 30 days or placed on Delay of Repair List

Compliance Group	Tag	Class	Date Reported	Effective Repair Due Date	Actual Repair Date		Issue	Note
No Pumps (in light liquid service) and Valves (in light liquid and/or gas-vapor service, and other than pressure relief devices) leaking above Internal Leak Threshold were not, within 30 days, repaired or placed on the Delay of Repair list or removed from service.								

ATTACHMENT 9, Appendix F

**LDAR Audit Findings, Corrective Actions, and Status
[118]**

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3rd Party LDAR Audit Issues

The most recent audit was completed in the 2nd half of 2011 and reported in the February 2012 report. All Corrective Actions from that audit were completed by the end of the 2nd half of 2011. There are no currently pending corrective actions.

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Attachment 10

Emission Summary Data

Attachment 10.
Semi-Annual Emissions Data
144.b.

Lemont Refinery
CITGO Petroleum Corporation
Semi-Annual Report

Emission Summary for Units Affected by Consent Decree
Jul-2012 through Dec-2012

	Tons/month						Total tons (6-mo)
	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	
FCCU							
CO	11.88	8.46	13.25	13.46	12.79	8.96	68.79
NOx	14.68	4.62	13.25	14.46	14.45	10.04	71.50
SO2	9.20	4.34	9.00	10.36	7.64	8.89	49.43
SRUs (SO2)							
119A-train	2.27	2.11	2.01	2.35	2.57	3.04	14.34
119 B-train	2.09	2.42	1.61	1.71	1.48	1.51	10.84
121 C-train	5.52	3.87	5.00	4.53	4.46	4.26	27.64
121 D-train	5.00	1.89	5.10	4.21	2.60	5.64	24.45
Total	14.89	10.30	13.73	12.80	11.11	14.45	77.27
Process Heaters (SO2)							
102 B-2	0.00	0.01	0.01	0.01	0.01	0.01	0.06
103 B-1	0.01	0.01	0.02	0.02	0.02	0.02	0.11
106 B-1	0.01	0.02	0.06	0.03	0.00	0.00	0.11
107 B-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00
108 B-41	0.01	0.01	0.04	0.03	0.01	0.01	0.10
108 B-42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
109 B-62	0.02	0.02	0.36	0.05	0.03	0.04	0.51
111 B-1A	0.39	0.31	0.55	0.66	0.59	0.66	3.16
111 B-1B	0.39	0.27	0.52	0.66	0.59	0.67	3.10
111 B-2	0.21	0.17	0.27	0.35	0.32	0.31	1.63
113 B-1	0.11	0.09	0.14	0.17	0.15	0.16	0.83
113 B-2	0.10	0.09	0.13	0.17	0.15	0.15	0.80
113 B-3	0.10	0.08	0.13	0.16	0.15	0.15	0.77
114 B-1	0.02	0.01	0.01	0.01	0.02	0.01	0.08
114 B-2	0.02	0.01	0.01	0.01	0.02	0.02	0.09
114 B-3	0.02	0.01	0.02	0.02	0.02	0.02	0.10
115 B-1	0.01	0.01	0.01	0.01	0.01	0.01	0.06
115 B-2	0.02	0.02	0.02	0.02	0.02	0.02	0.12
116 B-1	0.08	0.05	0.07	0.06	0.08	0.06	0.39
116 B-2	0.05	0.02	0.04	0.04	0.05	0.04	0.24
116 B-3	0.02	0.01	0.02	0.02	0.02	0.02	0.10
116 B-4	0.02	0.00	0.01	0.01	0.02	0.02	0.08
118 B-1	0.03	0.02	0.04	0.05	0.06	0.07	0.28
118 B-51	0.00	0.00	0.00	0.00	0.01	0.01	0.03
122 B-1	0.00	0.00	0.00	0.00	0.00	0.00	0.02
122 B-2	0.00	0.00	0.00	0.00	0.00	0.00	0.01
123 B-1	0.03	0.03	0.04	0.04	0.05	0.04	0.23
123 B-2	0.11	0.11	0.22	0.19	0.19	0.17	0.98
123 B-3	0.03	0.03	0.06	0.06	0.06	0.05	0.29
123 B-4	0.03	0.03	0.06	0.05	0.05	0.05	0.27
123 B-5	0.02	0.02	0.03	0.03	0.04	0.03	0.16
125 B-1	0.07	0.07	0.07	0.07	0.09	0.08	0.45
125 B-2	0.09	0.09	0.08	0.07	0.10	0.09	0.51
590 H-1	0.01	0.03	0.01	0.02	0.04	0.03	0.13
590 H-2	0.06	0.06	0.09	0.11	0.09	0.10	0.52
430 B-1	0.27	0.26	0.42	0.34	0.55	0.56	2.40
431 B-20	0.00	0.00	0.01	0.01	0.02	0.02	0.08
Total	2.38	1.96	3.58	3.55	3.66	3.69	18.82

Attachment 10.
Semi-Annual Emissions Data
144.b.

Lemont Refinery
CITGO Petroleum Corporation
Semi-Annual Report

Emission Summary for Units Affected by Consent Decree
Jul-2012 through Dec-2012

	Tons/month						Total tons (6-mo)
	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	
Process Heaters (NOx)							
111B-1A	2.30	2.12	2.61	2.58	2.43	3.06	15.10
111B-1B	2.05	1.54	2.25	2.53	2.31	2.79	13.47
111B-2	0.89	0.90	0.77	1.08	0.95	1.13	5.71
430B-1	1.94	2.31	2.76	2.18	3.48	3.91	16.58
431B-20	1.34	1.81	2.68	3.22	2.21	2.89	14.14
Total	8.52	8.68	11.07	11.59	11.38	13.77	65.00

